



Appendix C: Traffic Study



**I-26 Widening (MM 187 – 194) and
I-26/SC 27 Interchange
Improvements**

Traffic Analysis Report



June 2019

Prepared for:

South Carolina
Department of Transportation
(SCDOT)

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I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

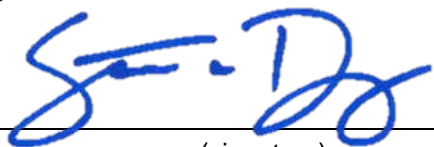
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Executive Summary

The South Carolina Department of Transportation (SCDOT) proposes to widen the segment of I-26 in Berkeley and Dorchester Counties between mile markers 187 and 194, adding one lane in each direction, while also making improvements to the I-26 & SC 27 interchange (Exit 187). This report summarizes the result of the traffic analysis performed for the I-26 widening and I-26 & SC 27 interchange improvements.

Per the language in the May 22nd, 2017 update of the Federal Highway Administration's (FHWA) Policy on Access to the Interstate System, the project study area includes the segment of I-26 located between mile marker (MM) 194 and 177 and includes the following interchanges:

Exit 194 – Jedburg Road (*improvements scheduled for construction*);
Exit 189 – Volvo Car Drive (*under construction*);
Exit 187 – SC 27 (*project interchange with proposed improvements*); and
Exit 177 – SC 453.

The traffic analysis includes a historical collision analysis for the past three years as well as AM and PM peak hour Highway Capacity Manual (HCM, 2010) analysis methodologies for analyzing interstate basic freeway segments, merges and diverges, as well as project intersections and two-lane highways capacity at the four cross-streets in the study area. The analysis includes 2018 Existing Conditions, 2023 (opening year) No-Build and Build Conditions, and 2043 (horizon year) No Build and Build Conditions. Four Build Condition alternatives were analyzed. Each of the build alternatives include the widening of I-26 between mile markers 194 and 187, with the differences between each alternative being the interchange type for improvements at the I-26 & SC 27 interchange:

Alternative 1: Traditional Diamond Interchange;
Alternative 2: Partial Cloverleaf Interchange (Parclo-B);
Alternative 3: Diamond with Single Loop Ramp; and
Alternative 4: Diamond Interchange with Roundabout Ramp Termini.

The project study area experienced 643 collisions over the past three years. Of the total collisions, the most frequently occurring type of collision were “no collision with motor vehicle” at a total of 287. The second most frequently occurring type of collision was rear end, followed by sideswipe, angle, head on, and backed into, in that order. I-26 within the study area experienced “no collision with motor vehicle” as the most frequently occurring type of collision. However, there were a particularly high number of rear end collisions at Jedburg Road along I-26. SC 27 and SC 453 experienced angle collisions as the most frequently occurring type of collision. In addition, at the I-26 & SC 27 interchange, there were a notable number of angle collisions at the intersection of SC 27 & I-26 westbound ramps. This could be due in part to sight distance at the intersection.

Of the 643 collisions, there were a total of 15 fatal crashes resulting in 17 fatalities, 163 collisions resulting in an injury, and 465 collisions which caused property damage only. Of the 15 fatal crashes, 14 occurred along I-26. Of these 14 fatal crashes, 10 involved drivers hitting trees resulting in fatal injuries – 4 hitting



tree(s) outside the right shoulder, 5 hitting tree(s) in the median which remain uncleared, and 1 hitting tree(s) in the median in an area which has since been cleared of trees. While not enough information is available to examine the clear-zone in the cases of each of the 4 tree-related collisions outside the right shoulder, it is recommended that clear-zone distances be reviewed as part of this I-26 widening project, as there may be an opportunity to lower the likelihood of fatal collision in run-off-the-road collision events. Also, given that over one-third (5 collisions) of the fatal collisions along I-26 in the last three years involved trees in uncleared sections of the median, another potential opportunity to lower the likelihood of fatal injuries may include additional tree-clearing in the median along I-26 in areas which were not part of the previous median tree-clearing effort.

Existing traffic volumes along the I-26 corridor and at ramp terminal and other adjacent intersections in the project area were collected and used to project future demand volumes based on anticipated growth in the area as forecasted by the Charleston Area Transportation Study (CHATS) travel demand model as well as additionally anticipated developments in the area. These volumes were used in the existing and future condition capacity analysis.

The capacity analysis results indicate that while the mainline of I-26 currently operates and is anticipated to continue to operate at acceptable levels of service through at least 2023, it is projected to experience undesirable, and in some areas, failing levels of service in the design year (2043) without any improvements.

The widening of I-26 from four to six lanes mitigates these undesirable design year levels of service in all but two locations in the westbound direction (Diverges at Jedburg Road and at SC 453), which are projected to experience undesirable LOS E in 2043. However, the projected densities at these locations (35.5 pc/mi/ln and 35.4 pc/mi/ln, respectively) are both very close to the LOS E threshold of 35 pc/mi/ln and are also equivalent to the projected density and LOS in the No-Build conditions. Therefore, since the interchange improvements proposed with this project are limited to the I-26 & SC 27 interchange, and since the improvements (for any of the four alternatives) proposed at this interchange do not degrade the undesirable LOS at the two aforementioned locations such that they are worse than the No-Build conditions, no additional improvements to mitigate these levels of service are recommended in conjunction with this project.

Concerning the improvements to the I-26 & SC 27 interchange, the results of the capacity analysis for each of the four build alternatives indicate that each of the alternatives enhances the operation of the interchange such that acceptable levels of service are anticipated in both the opening (2023) and design year (2043).



1.0 INTRODUCTION

I-26 provides a major travel corridor running east-west between Tennessee and South Carolina. The I-26 corridor in this project's study area in Berkeley and Dorchester Counties serves as a commuting route as well as provides access to existing and anticipated industrial land uses.

The South Carolina Department of Transportation (SCDOT) proposes to widen the segment of I-26 between mile markers 187 and 194, adding one lane in each direction, while also making improvements to the I-26 & SC 27 interchange (Exit 187).

The I-26 & SC 27 project interchange and the segment of the interstate proposed for widening is located in Berkeley County.

This report summarizes the result of the traffic analysis performed for the I-26 widening and I-26 & SC 27 interchange improvements.

Per the language in the May 22nd, 2017 update of the Federal Highway Administration's (FHWA) Policy on Access to the Interstate System, *the analysis also includes the first adjacent existing or proposed interchange on either side of the proposed change in access*. In this case, this analysis included the existing interchanges of I-26 & SC 453 interchange to the west (Exit 177) as well as the I-26 & Jedburg Road to the east (Exit 194).

Additionally, the Volvo Car Drive interchange (Exit 189) is currently under construction between the I-26 & SC 27 and I-26 & Jedburg Road interchanges. Given its adjacency to the project interchange, as well as location along the segment of I-26 proposed for widening, it was also included in the analysis.

Therefore, the project study area includes the segment of I-26 located between MM 194 and 177 and includes the following interchanges, as shown in Figure 1:

- (1) Exit 194 – Jedburg Road (*improvements scheduled for construction*);
- (2) Exit 189 – Volvo Car Drive (*under construction*);
- (3) Exit 187 – SC 27 (*project interchange with proposed improvements*); and
- (4) Exit 177 – SC 453.

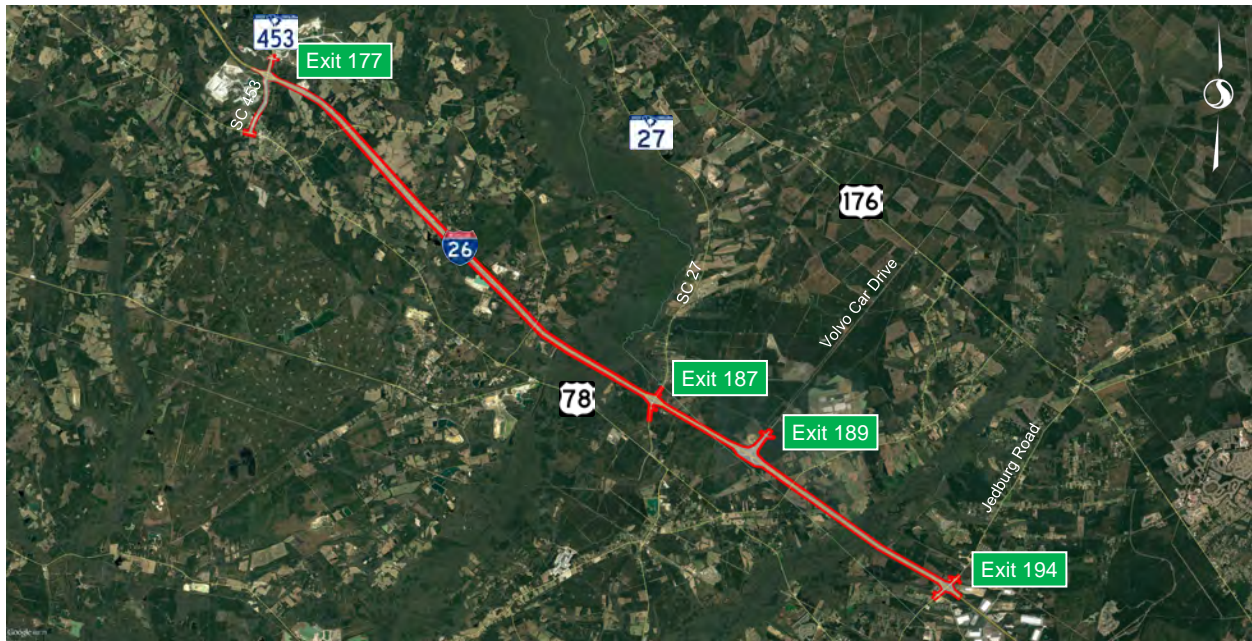
The traffic analysis includes AM and PM peak hour Highway Capacity Manual (HCM, 2010) analysis methodologies for analyzing interstate basic freeway segments, merges, and diverges, as well as project intersections and two-lane highways capacity at the four cross-streets in the study area.



I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

Introduction
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Figure 1 – Project Study Area



The analysis includes 2018 Existing Conditions, 2023 (opening year) No-Build and Build Conditions, and 2043 (horizon year) No Build and Build Conditions. Four Build Condition alternatives were analyzed. Each of the build alternatives include the widening of I-26 between mile markers 194 and 187, with the differences between each alternative being the interchange type for improvements at the I-26 & SC 27 interchange:

- Alternative 1: Traditional Diamond Interchange;
- Alternative 2: Partial Cloverleaf Interchange (Parclo-B);
- Alternative 3: Diamond with Single Loop Ramp; and
- Alternative 4: Diamond Interchange with Roundabout Ramp Termini.



2.0 STUDY AREA DESCRIPTION

2.1 INTERSTATE DESCRIPTION

I-26 is an east-west interstate highway that begins at Kingsport, Tennessee at US 11 West, running generally southeast through Tennessee, North Carolina, and South Carolina, where it terminates at US 17 in Charleston, South Carolina. The 221 miles of I-26 in South Carolina provides access to Charleston, Summerville, Orangeburg, Columbia, and Spartanburg. Throughout the study area, I-26 currently provides two, 12-foot lanes in each direction, with 10-foot paved shoulders and a grassy/tree-filled median divider. The posted speed limit is 70 mph.

2.2 INTERCHANGE DESCRIPTIONS

2.2.1 Exit 194 – Jedburg Road

As shown in Figure 2, Jedburg Road is currently a two-lane arterial (south of I-26) and a two-lane major collector (north of I-26), with a posted speed limit of 45 mph. The 2017 AADT along Jedburg Road was 12,600 vpd south of I-26 and 8,400 north of I-26. The I-26 & Jedburg Road interchange (Exit 194) is currently a traditional diamond interchange with signalized ramp terminals. The existing ramp acceleration/deceleration lane lengths (as defined in the HCM, 2010) are as follows:

I-26 WB Off-Ramp Deceleration Lane:	465 feet (parallel lane exit)
I-26 WB On-Ramp Acceleration Lane:	800 feet (parallel lane entrance)
I-26 EB Off-Ramp Deceleration Lane:	500 feet (parallel lane exit)
I-26 EB On-Ramp Acceleration Lane:	1,120 feet (parallel lane entrance)

An improvement project is planned for this interchange (as shown in Figure 3) which will widen I-26 to three lanes in each direction to just west of the interchange, widen Jedburg Road to two-lanes in each direction in the vicinity of the interchange, and add a westbound loop off-ramp to serve vehicles exiting the interstate desiring to travel southbound on Jedburg Road (changing the access of the other westbound off-ramp to serve only those vehicles traveling northbound on Jedburg Road). These improvements are anticipated to be completed prior to the opening year of this improvement (2023) and therefore are considered in all future year analysis. With these improvements, the anticipated ramp acceleration/deceleration lane lengths (as defined in the HCM, 2010) are as follows:

I-26 WB Off-Ramp Deceleration Lane:	150 feet (taper exit)
I-26 WB Loop Off-Ramp Deceleration Lane:	850 feet (parallel lane exit)
I-26 WB On-Ramp Acceleration Lane:	1,650 feet (parallel lane entrance)
I-26 EB Off-Ramp Deceleration Lane:	180 feet (taper exit)
I-26 EB On-Ramp Acceleration Lane:	1,120 feet (parallel lane entrance)

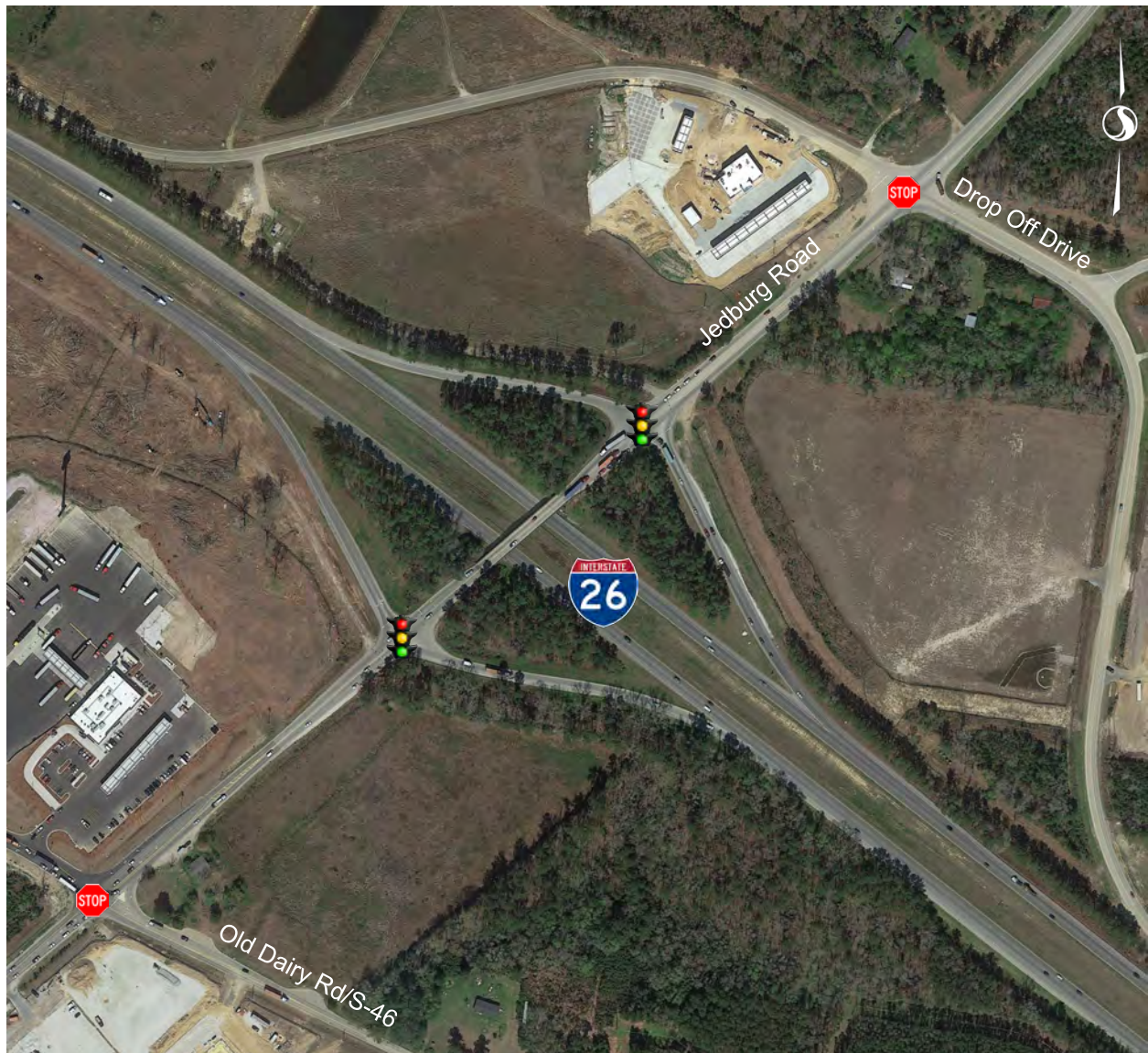


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Additionally, the stop-controlled intersections of Jedburg Road & Drop-Off Drive and Jedburg Road & Old Dairy Road/S-46 were included in the analysis due to their proximity to the interchange.

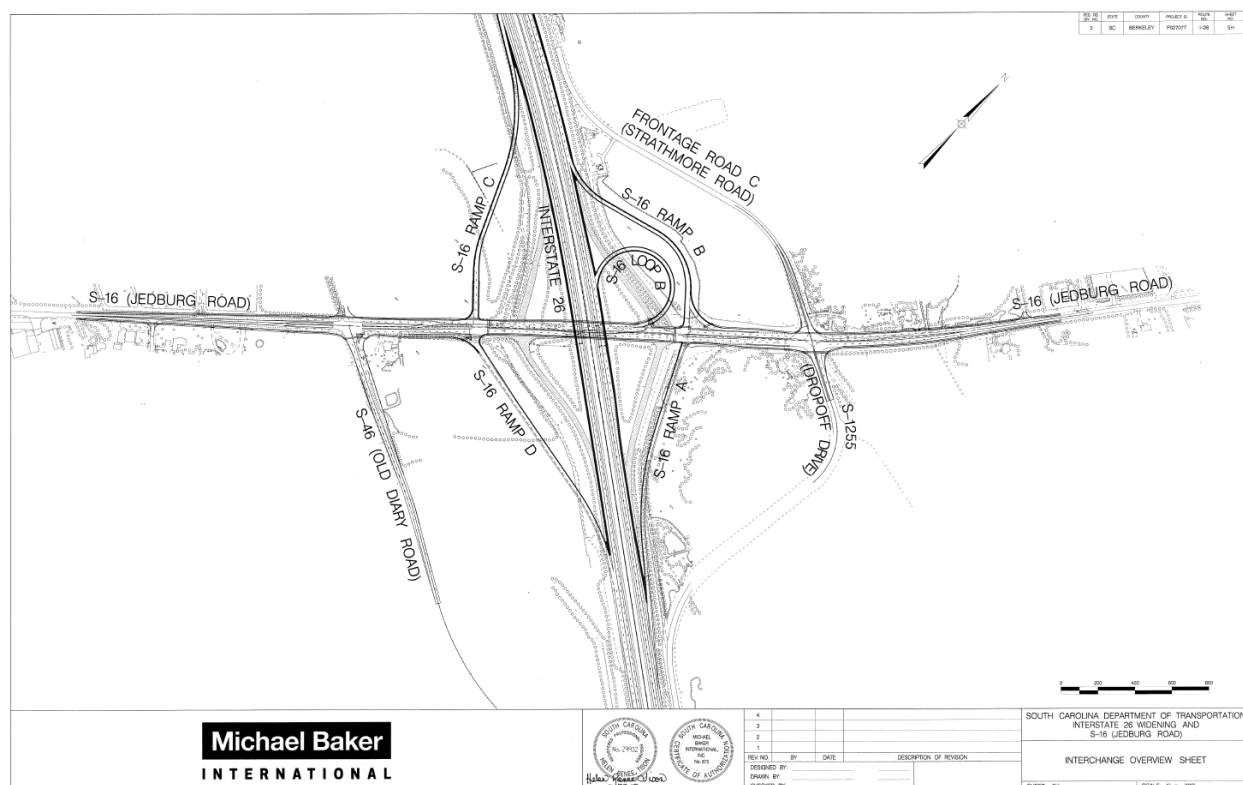
Figure 2 – Jedburg Road (Exit 194) Existing Interchange Configuration



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Figure 3 – Jedburg Road (Exit 194) Interchange Improvements



2.2.2 Exit 189 – Volvo Car Drive

As shown in Figure 4, the new Volvo Car Drive interchange (currently under construction, with expected completion prior to the opening year of this project) is a directional interchange which provides access to Volvo Car Drive and the industrial land uses along this roadway. The westbound off-ramp and eastbound on-ramp each have two lanes while the westbound on-ramp and eastbound off-ramp each have one lane per ramp. The existing ramp acceleration/deceleration lane lengths (as defined in the HCM, 2010) are as follows:

- I-26 WB Off-Ramp Deceleration Lane: 1,500 feet (deceleration lane 1) + 1,500 feet (deceleration lane 2)
- I-26 WB On-Ramp Acceleration Lane: 1,800 feet
- I-26 EB Off-Ramp Deceleration Lane: 1,200 feet
- I-26 EB On-Ramp Acceleration Lane: 1,500 feet (acceleration lane 1) + 1,500 feet (acceleration lane 2)



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As shown in Figure 5, SC 27 is currently a two-lane major collector with a posted speed limit of 40 mph south of I-26 and 50 mph north of I-26. The 2017 AADT along Jedburg Road was 10,100 vpd south of I-26 and 2,600 north of I-26. The I-26 & SC 27 interchange (Exit 187) is currently a traditional diamond interchange with stop-controlled ramp terminals. The existing ramp acceleration/deceleration lane lengths (as defined in the HCM, 2010) are as follows:

I-26 WB Off-Ramp Deceleration Lane:	500 feet (parallel lane exit)
I-26 WB On-Ramp Acceleration Lane:	900 feet (parallel lane entrance)
I-26 EB Off-Ramp Deceleration Lane:	450 feet (parallel lane exit)
I-26 EB On-Ramp Acceleration Lane:	800 feet (parallel lane entrance)



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Figure 5 – SC 27 (Exit 187): Existing Interchange Configuration



As previously referenced, four build alternatives are proposed for the SC 27 interchange improvements:

As shown in Figure 6, Build Alternative 1 is a traditional diamond interchange with one off-ramp and one on-ramp in each direction of travel. The proposed ramp acceleration/deceleration lane lengths (as defined in the HCM, 2010) are as follows:

I-26 WB Off-Ramp Deceleration Lane:	250 feet (taper exit)
I-26 WB On-Ramp Acceleration Lane:	900 feet (parallel lane entrance)
I-26 EB Off-Ramp Deceleration Lane:	250 feet (taper exit)
I-26 EB On-Ramp Acceleration Lane:	900 feet (parallel lane entrance)



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Figure 6 – SC 27 (Exit 187): Alternative 1: Traditional Diamond Configuration



As shown in Figure 7, Build Alternative 2 is a partial cloverleaf interchange with two off-ramps (one being a loop-off ramp) and one on-ramp in each direction of travel. The proposed ramp acceleration/deceleration lane lengths (as defined in the HCM, 2010) are as follows:

I-26 WB Off-Ramp Deceleration Lane:	250 feet (taper exit)
I-26 WB Loop-Off Ramp Deceleration Lane:	650 feet (parallel lane exit)
I-26 WB On-Ramp Acceleration Lane:	900 feet (parallel lane entrance)
I-26 EB Off-Ramp Deceleration Lane:	250 feet (taper exit)
I-26 EB Loop-Off Ramp Deceleration Lane:	650 feet (parallel lane exit)
I-26 EB On-Ramp Acceleration Lane:	900 feet (parallel lane entrance)



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Figure 7 – SC 27 (Exit 187): Alternative 2: Partial Cloverleaf Configuration



Build Alternative 3 is a diamond interchange with a single loop-off ramp in the westbound direction. The configuration of ramps in the westbound direction is the same as that of the westbound direction of Build Alternative 2 and the configuration of ramps in the eastbound direction is the same as that of the eastbound direction in Alternative 1. The proposed ramp acceleration/deceleration lane lengths (as defined in the HCM, 2010) are as follows:

I-26 WB Off-Ramp Deceleration Lane:	250 feet (taper exit)
I-26 WB Loop-Off Ramp Deceleration Lane:	650 feet (parallel lane exit)
I-26 WB On-Ramp Acceleration Lane:	900 feet (parallel lane entrance)
I-26 EB Off-Ramp Deceleration Lane:	250 feet (taper exit)
I-26 EB On-Ramp Acceleration Lane:	900 feet (parallel lane entrance)



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As shown in Figure 8, Build Alternative 4 is a diamond interchange with multi-lane roundabout ramp termini, with one off-ramp and one on-ramp in each direction of travel. The proposed ramp acceleration/deceleration lane lengths (as defined in the HCM, 2010) are as follows:

I-26 WB Off-Ramp Deceleration Lane:	250 feet (taper exit)
I-26 WB On-Ramp Acceleration Lane:	900 feet (parallel lane entrance)
I-26 EB Off-Ramp Deceleration Lane:	250 feet (taper exit)
I-26 EB On-Ramp Acceleration Lane:	900 feet (parallel lane entrance)

Figure 8 – SC 27 (Exit 187): Alternative 4: Traditional Diamond Configuration



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2.2.4 Exit 177 – SC 453

As shown in Figure 9, SC 453 is currently a two-lane major collector with a posted speed limit of 35 mph. The 2017 AADT along Jedburg Road was 4,600 vpd south of I-26 and 4,400 north of I-26. The I-26 & SC 453 interchange (Exit 177) is currently a traditional diamond interchange with stop-controlled ramp terminals. The existing ramp acceleration/deceleration lane lengths (as defined in the HCM, 2010) are as follows:

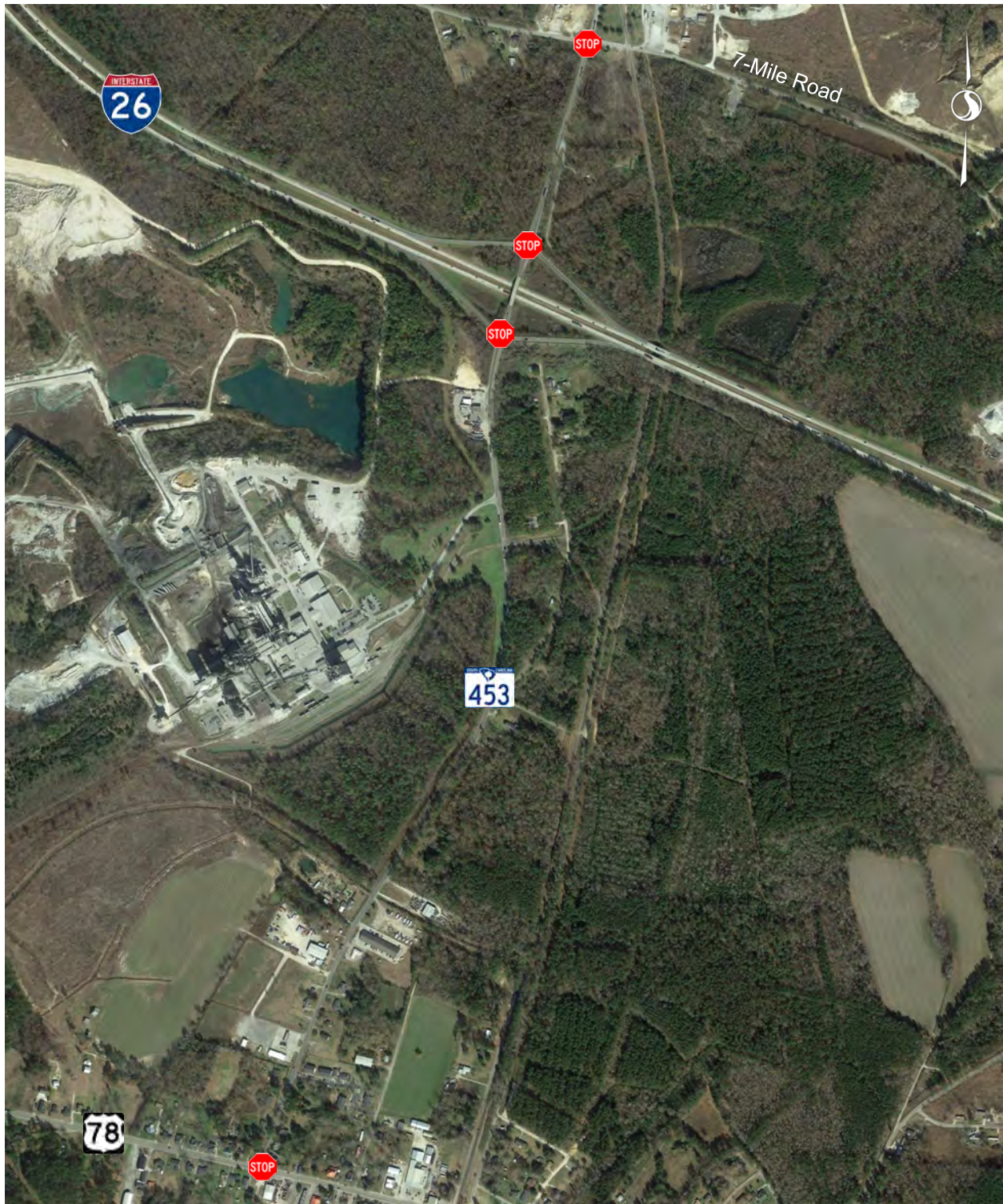
I-26 WB Off-Ramp Deceleration Lane:	475 feet (parallel lane exit)
I-26 WB On-Ramp Acceleration Lane:	800 feet (parallel lane entrance)
I-26 EB Off-Ramp Deceleration Lane:	465 feet (parallel lane exit)
I-26 EB On-Ramp Acceleration Lane:	800 feet (parallel lane entrance)



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Figure 9 – SC 453 (Exit 177) Existing Interchange Configuration



3.0 DATA COLLECTION

3.1 I-26 MAINLINE TRAFFIC VOLUMES

3.1.1 Historic I-26 Mainline Volumes

Historic I-26 mainline traffic volume data was obtained from two SCDOT sources. Historic AADT data from 2002 through 2017 was obtained from SCDOT's database of AADT on segments for state primary and secondary roadways. This AADT data was used in the development of growth rates used to forecast future traffic. Secondly, hourly traffic volume data was obtained for the months of January 2017 through December 2017 from two permanent Automatic Traffic Recording (ATR) stations located within the study area, provided by SCDOT. The two ATR stations are identified by SCDOT as Stations P-54 and P-72 along I-26 between Jedburg Road and SC 453, as shown in Figure 10. ATR data from stations P-54 and P-72 was used to establish the design hour traffic volumes.

Figure 10 – Location of ATR Count Stations



3.1.2 Existing I-26 Mainline Volumes

Existing mainline traffic volumes counts were conducted in May of 2018. Seven-day counts (with 5-minute collection intervals) were taken at two locations along the study corridor: (1) Between Jedburg Road and SC 27 and (2) between SC 27 and SC 453.



I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

Data Collection

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3.2 INTERSECTION TURNING MOVEMENT COUNTS

Turning movement traffic count data was obtained for ramp termini and other adjacent intersections within the study area. The turning movement count data was collected May 9th, 2018 and included typical 4-hour counts (7 am – 9 am and 4 pm – 6 pm), but in some instances included 8-hour counts (from 8 am – 5 pm):

Exit 194 (Jedburg Road):

- Jedburg Road & Drop-Off Drive (8-hour);
- Jedburg Road & I-26 WB Ramps (4-hour);
- Jedburg Road & I-26 EB Ramps (4-hour); and
- Jedburg Road & Old Diary Road/S-8-46 (8-hour).

Exit 187 (SC 27):

- SC 27 & Emma Lane (4-hour);
- SC 27 & Miles Lane (4-hour);
- SC 27 & I-26 WB Ramps (8-hour);
- SC 27 & I-26 EB Ramps (8-hour); and
- SC 27 & Jared Lane (4-hour).

Exit 177 (SC 453):

- SC 453 & 7 Mile Road (4-hour);
- SC 453 & I-26 WB Ramps (8-hour);
- SC 453 & I-26 EB Ramps (8-hour); and
- SC 453 & US 178/W. Main Street (4-hour).

3.3 CRASH DATA

Historic crash data was provided by the SCDOT Safety Office. The crash data for the interstate corridor, ramps, and cross-streets covered the period of January 2014 through December 2016.

These most recent, available three years of crash data within the study limits across Berkeley and Dorchester County, SC were analyzed to identify high crash locations in the project study area for potential mitigation options. The road segments that were analyzed included:

1. I-26 from mile marker 176.3 to 194.9;
2. Jedburg Rd from mile marker 0.56 to 1.44;
3. SC 27 from mile marker 0.175 to 0.91; and
4. SC 453 from mile marker 0 to 1.86.



4.0 COLLISION ANALYSIS

A collision analysis was performed using the three most recent years of available crash data (2014-2016) obtained for the entire interstate corridor study area. This data included crashes occurring on the interstate, interstate ramps, and along the cross-streets at each of the three existing study area interchanges. The road segments that were analyzed included:

1. I-26 from mile marker 176.3 to 194.9;
2. Jedburg Rd from mile marker 0.56 to 1.44;
3. SC 27 from mile marker 0.175 to 0.91; and
4. SC 453 from mile marker 0 to 1.86.

The total of each type of collision for each road area are tabulated in Table 1 below.

Table 1 – Total Crashes by Type

Road	Number of Collisions (2014 through 2016) by Type of Collision						Total
	Angle	Head On	No Collision with Motor Vehicle	Rear End	Sideswipe	Backed Into	
I-26	26	3	280	178	87	2	576
Jedburg Road	9	1	4	32	0	0	46
SC 27	8	0	3	6	1	0	18
SC 453	3	0	0	0	0	0	3
Total	46	4	287	216	88	2	643

The project study area experienced 643 collisions over the past three years. Of the total collisions, the most frequently occurring type of collision were “no collision with motor vehicle” at a total of 287.

Crash severity for each roadway is shown in Table 2. During the last three years within the study area, there were a total of 15 fatal crashes resulting in 17 fatalities, 163 collisions resulting in an injury, and 465 collisions which caused property damage only. Of the 15 fatal crashes, 14 occurred along I-26. Of these 14 fatal crashes, 10 involved drivers hitting trees resulting in fatal injuries – 4 hitting tree(s) outside the right shoulder, 5 hitting tree(s) in the median which remain uncleared, and 1 hitting tree(s) in the median in an area which has since been cleared of trees. While not enough information is available to examine the clear-zone in the cases of each of the 4 tree-related collisions outside the right shoulder, it is recommended that clear-zone distances be reviewed as part of this I-26 widening project, as there may be an opportunity to lower the likelihood of fatal collisions in run-off-the-road collision events. Also, given that over one-third (5 collisions) of the fatal collisions along I-26 in the last three years involved trees in uncleared sections of the median, another potential opportunity to lower the likelihood of fatal injuries may include additional tree-clearing in the median along I-26 in areas which were not part of the previous median tree-clearing effort.



I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

Collision Analysis

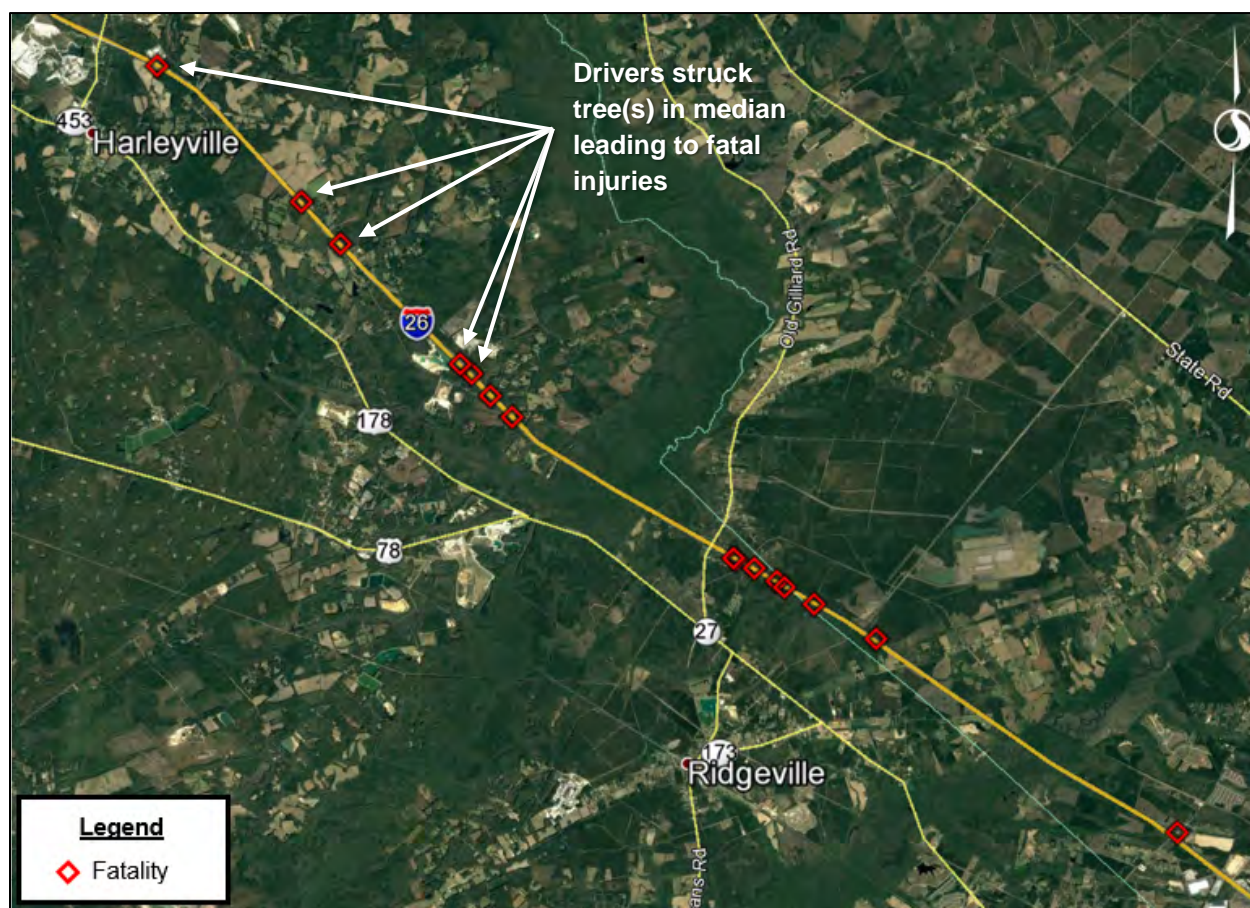
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Table 2 – Crash Severity

Road	Severity			Total
	Property Damage Only	Injury	Fatal	
I-26	414	148	14	576
Jedburg Road	38	7	1	46
SC 27	11	7	0	18
SC 453	2	1	0	3
Total	465	163	15	643

Figure 11 shown below displays the 15 locations of fatal collisions over the three-year period within the study area. Fourteen of the fatal collisions occurred on I-26 and one occurred on Jedburg Road.

Figure 11 – Fatal Collision Locations



I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

Collision Analysis

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The remainder of this chapter of the report includes a discussion of each road, devoting particular attention to areas along these roadways that present the greatest apparent danger from the crash data analysis.

4.1 I-26 COLLISIONS

The locations on I-26 that experienced higher collisions are displayed in Figure 12, along with the type of collision in Figure 13. Figure 12 shows that mile marker 194.4 experienced the highest total collisions over the past three years. This area is the location where vehicles exit/enter I-26 to/from Jedburg Road. As shown in Figure 14, most of these collisions were rear end collisions and occurred on the I-26 westbound off-ramp.

Figure 12 – I-26 Collisions (2014-2016)

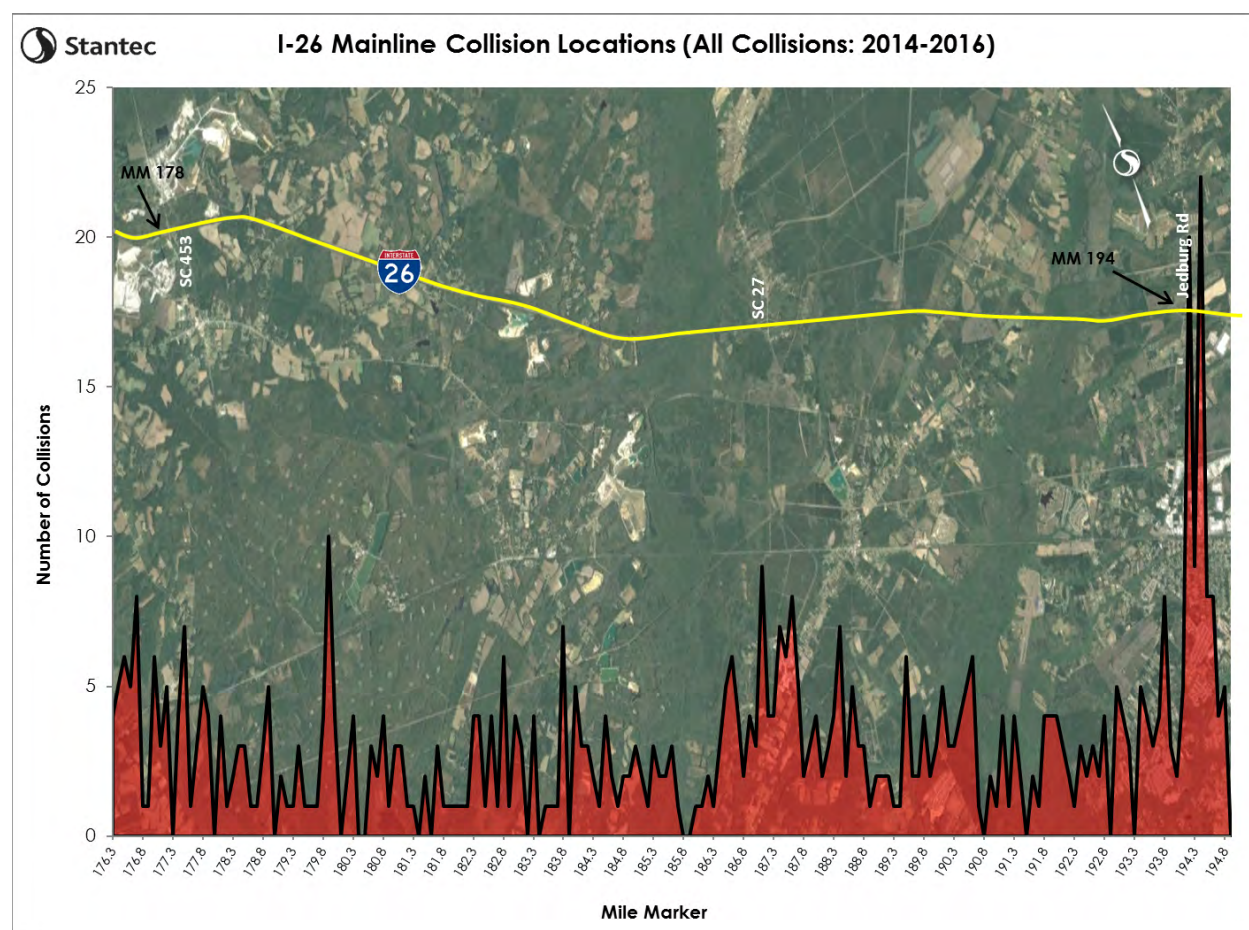


Figure 13 shows the collisions along I-26 by type of collision. The high number of rear-end collisions at mile marker 194.4 can be seen on this graph. In addition, the data shows that of the collisions along I-26, the most frequently occurring type of collision was no collision with motor vehicle at a total of 280 collisions. This type of collision typically implies the vehicle ran off the road or hit an obstruction in the road such as an animal or debris.



I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

Collision Analysis
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Figure 13 – I-26 Collisions by Type (2014-2016)

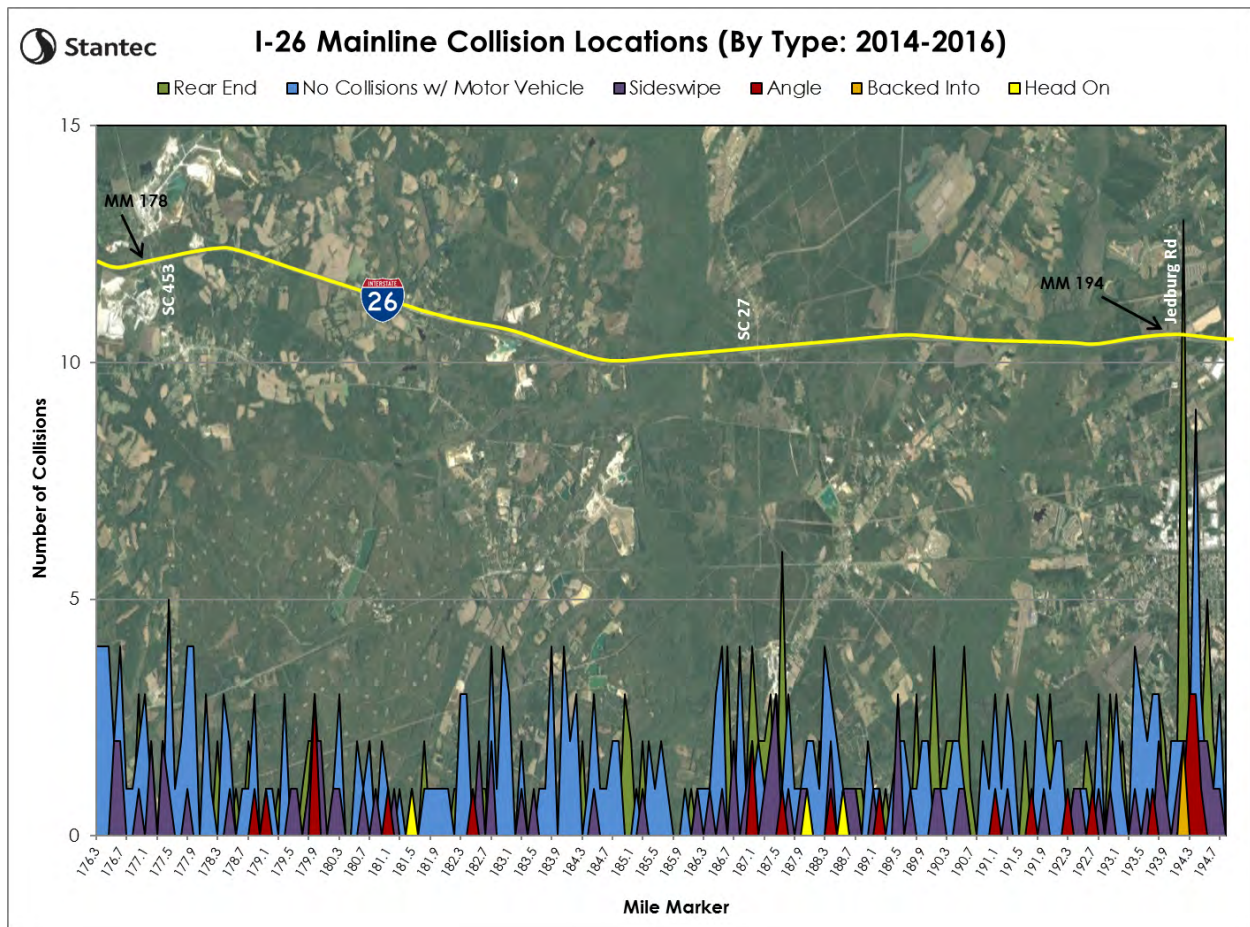


Figure 14 – I-26 & Jedburg Road Ramp Collisions



I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

Collision Analysis

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Figure 15 shows the amount of collisions occurring in each year. There were 168 collisions in 2014, 211 collisions in 2015, and 197 collisions in 2016.

Figure 15 – I-26 Collisions by Year

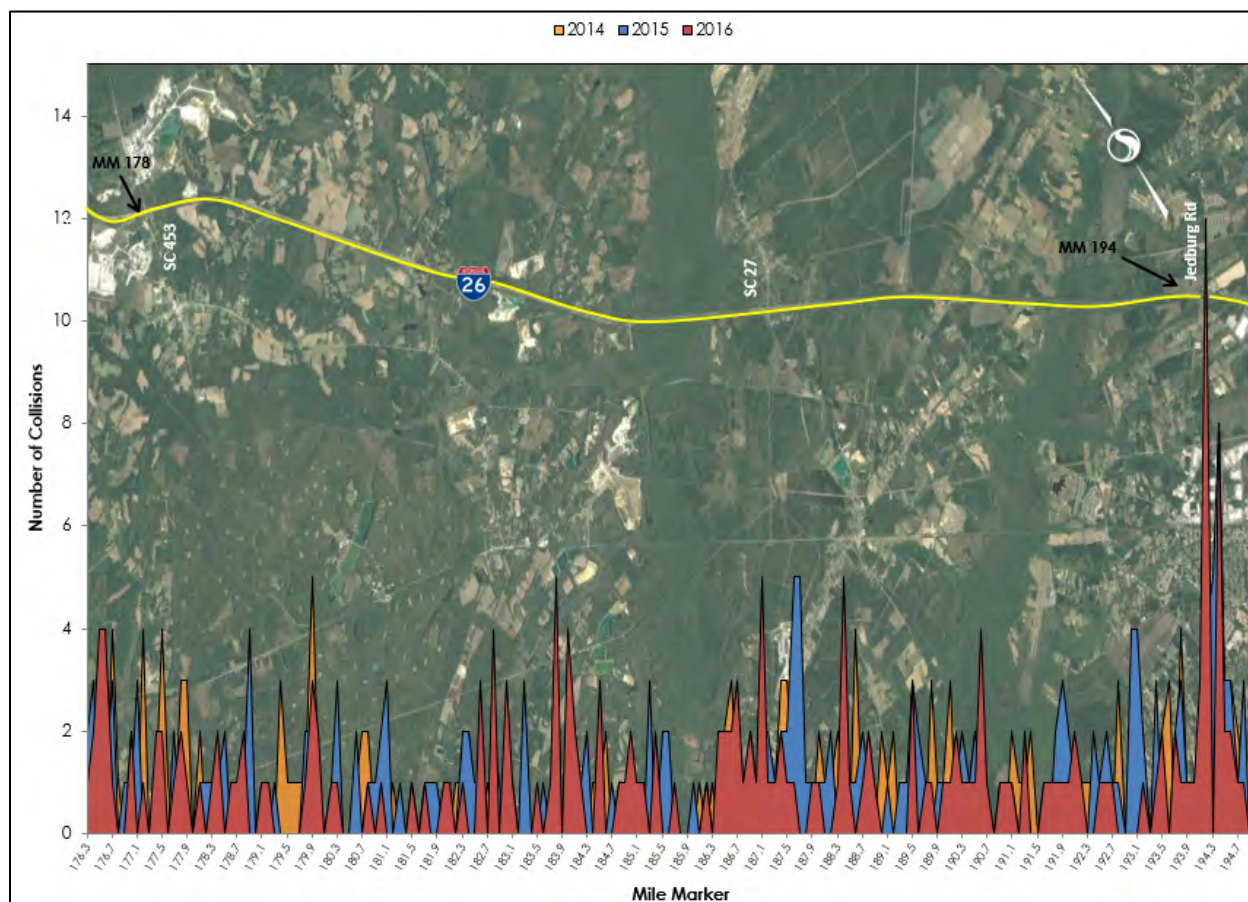


Table 3 below lists the three noteworthy problem locations that experienced 10 or more crashes over the three-year period within the study area along I-26.

Table 3 – High-Collision Locations by Type

I-26 Mile Marker (10 or more crashes)	Type of Collision						Total
	Angle	Head-On	No Collision with Motor Vehicle	Rear End	Sideswipe	Backed Into	
179.9	3	0	3	2	2	0	10
194.2	1	0	2	13	2	2	20
194.4	3	0	9	7	2	0	21
Total	7	0	14	22	6	2	51



I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

Collision Analysis

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As seen in Table 3, the highest number of collisions occurred at mile marker 194.2 and 194.4 with a majority of these collisions being rear end collisions occurring on or near the I-26 westbound off-ramp. Mile marker 179.9, located approximately three miles southeast of Exit 177- SC 453, had the third highest number of collisions.

4.2 JEDBURG ROAD COLLISIONS

As shown below in Figure 16, the most frequently occurring type of collision along Jedburg Road within the study area were rear end collisions. Figure 16 shows that only one segment within the study area, mile marker 1.17, along this road experienced a total of more than 10 crashes over the past three years of data. Mile marker 1.17 is located at the intersection of Jedburg Rd and the I-26 westbound on/off ramps. The majority of collisions at mile marker 1.17 are classified as rear end collisions.

Figure 16 – Jedburg Road Collisions



I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

Collision Analysis

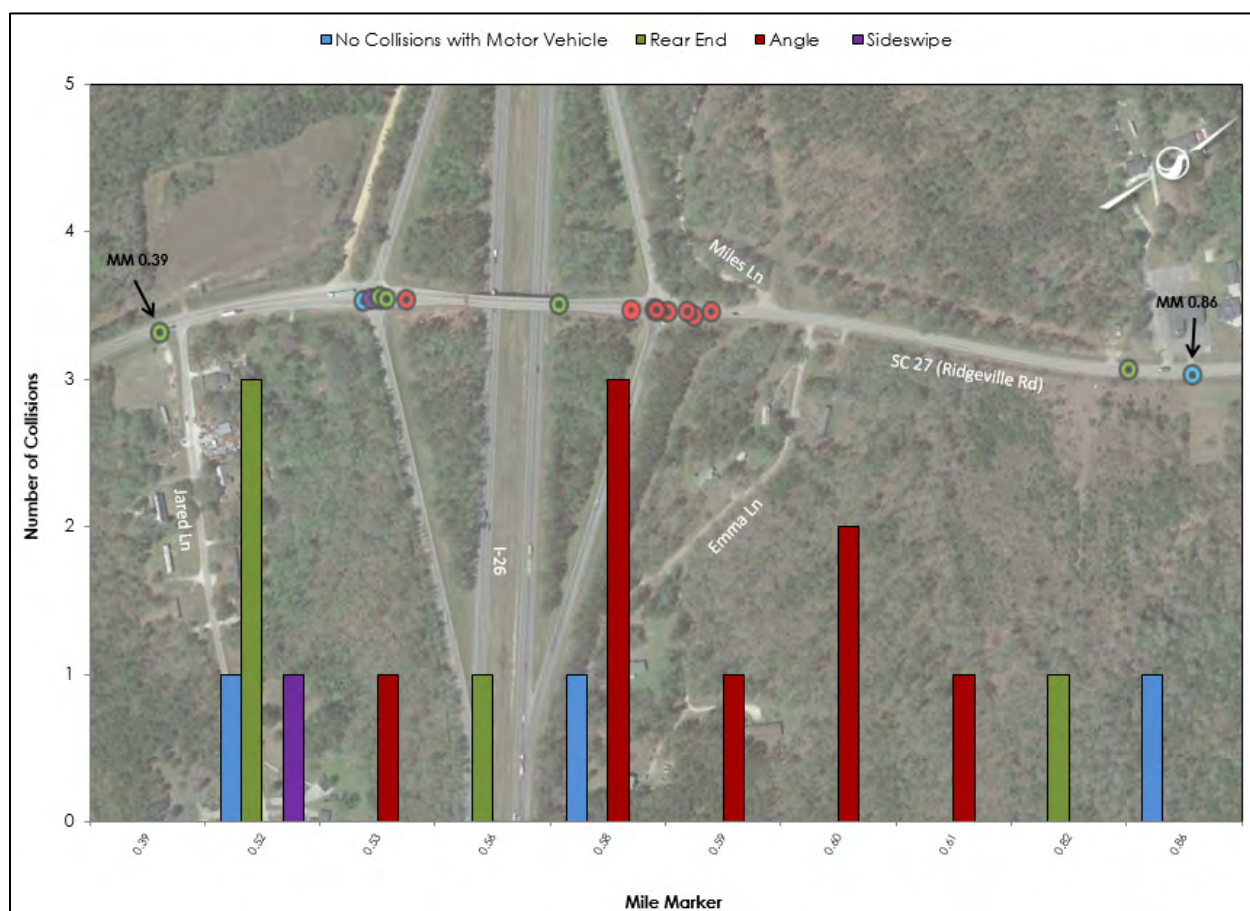
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4.3 SC 27 COLLISIONS

As shown in Figure 17, the locations and the totals of each type of collision along SC 27 are displayed. The segments within the study area along this road did not experience more than 10 total crashes over the past three years of data. The most frequently occurring type of collision along SC 27 within the study area was angle collisions.

Figure 17 shows that mile markers 0.52 and 0.58 experienced the highest total collisions along this roadway over the past three years in the study area. Mile marker 0.52 is located at the intersection of SC 27 and the I-26 eastbound on/off ramps. Most of the collisions occurring at this intersection were rear end collisions. Mile marker 0.58 is located at the intersection of SC 27 and the I-26 westbound on/off ramps. A majority of the collisions occurring at mile marker 0.58 were angle collisions.

Figure 17 – SC 27 Collisions



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Collision Analysis

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4.4 SC 453 COLLISIONS

As shown in Figure 18, there were only three crashes along SC 453 within the study area over the past three years. All of the collisions were angle collisions.

Figure 18 – SC 453 Street Collisions



4.5 SUMMARY

The three years of data collected (2014-2016) showed that the project study area experienced 643 collisions over the past three years. Of the total collisions, the most frequently occurring type of collision were no collision with motor vehicle at a total of 287. The second most frequently occurring type of collision was rear end, followed by sideswipe, angle, head on, and backed into in that order. Of the 643 collisions, 15 were fatal. Of the fatal collisions 14 occurred on I-26 and one occurred on Jedburg Road. Of the remaining collisions, 163 resulted in an injury and 465 collisions caused property damage only.

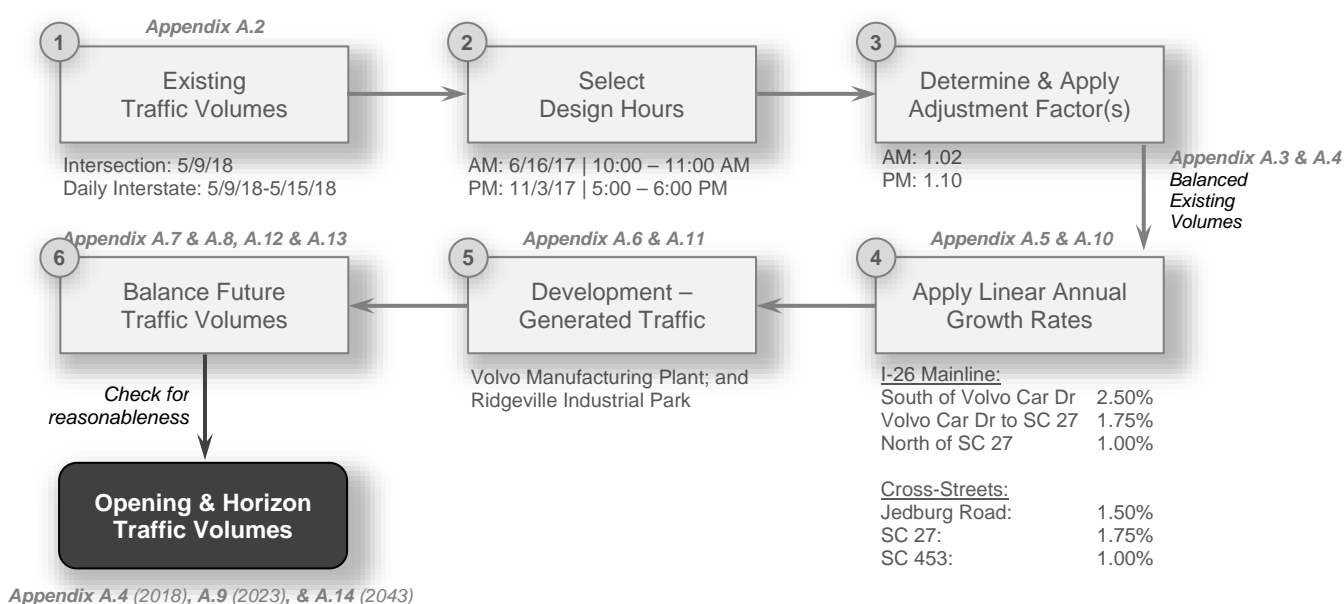
I-26 within the study area experienced no collision with motor vehicle as the most frequently occurring type of collision. However, there were a particularly high number of rear end collisions at Jedburg Road along I-26. SC 27 and SC 453 experienced angle collisions as the most frequently occurring type of collision. In addition, along I-26 at SC 27 there were a notable number of rear end collisions.



5.0 TRAFFIC VOLUME FORECASTING

The traffic analysis scenarios considered 2018 Existing Conditions, 2023 Opening Year No Build and Build Conditions, and 2043 Design Year No Build and Build Conditions. For the Build Condition scenarios, four alternative build configurations at the I-26 and SC 27 interchange were analyzed. In order to develop peak hour forecasts for each of the analysis scenarios listed above, the process shown in Figure 19 was used. For each step in the process, traffic volume exhibits have been included in Appendix A.

Figure 19 – Traffic Volume Development Process



5.1 EXISTING TRAFFIC VOLUMES

Stantec performed daily counts from Wednesday, May 9th, 2018 to Tuesday, May 15th, 2018 along I-26 at two locations – (1) between Jedburg Road and Volvo Car Drive and (2) between SC 27 and SC 453. Turning movement counts at intersections in the study area were collected on Wednesday, May 9th, 2018. These counts were used to determine AM and PM peak hour turning movement volumes at the intersections as well as ramp volumes. With the mainline, ramp, and intersection AM and PM 2018 Existing peak hour volumes determined, the volumes were balanced along the mainline and along each cross-street.

5.2 SELECT DESIGN HOURS

As required in the American Association of State Highway and Transportation Officials' (AASHTO) *A Policy on Design Standards Interstate System*, 5th Edition (January 2005), the 30th design hour should be used to determine the appropriate traffic volume used for the design. The Transportation Research Board's Highway Capacity Manual 2010 and the Institute of Transportation Engineers' (ITE) Traffic Engineering



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Traffic Volume Forecasting

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Handbook, 7th Edition (2016) have nearly identical language with respect to the selection of the design hour volume. All publications indicate the rationale by which 30th highest hour traffic volume is selected for use as the design hour traffic volume for highways.

The 30th highest hourly volume is determined by listing traffic volumes for every hour of every day in a calendar year in descending order from highest to lowest. The 30th volume in this list is the 30th highest-hour volume. Graphing the volumes in descending order can show a large variation in volumes, generally taking the form of a curve that initially descends steeply and ends in a more gently declining, almost linear slope. The design hour is usually selected from the “knee of the curve” – the area between the initial steep descent and the more gradually declining linear slope. The reason for this is described in the Highway Capacity Manual, “the selection of an appropriate hour for planning, design, and operational purposes is a compromise between providing an adequate level of service (LOS) for every (or almost every) hour of the year and economic efficiency.” Simply put, building a highway to accommodate traffic volumes on the initial steep slope of the volume curve can be very expensive and provide under-used capacity. Some measure of infrequent congestion under exceptional circumstances may be appropriate and allowable from a design standpoint. Standard practice is to base highway design on an hour between the 30th and 100th highest hour of the year. This range of hours generally falls within the “knee” in the graphed curve of the volume data. In standard practice, the knee is assumed to occur at the 30th highest hour which is why this hour is used as the basis for estimates of design hour volume.

For the proposed I-26 Widening Project from MM 187 to MM 194, the existing traffic volumes along I-26 were reviewed to determine if the use of the 30th highest hour was appropriate for the existing conditions and context of the improvement. A review was conducted of available traffic data from Automatic Traffic Recorder (ATR) station(s) P-54 and P-72 along I-26 between Jedburg Road/S-8-16 and SC 453/Judge Street, between January 2017 and December 2017.

ATR station P-54 was given higher priority over station P-72 in the design hour review process due to the fact that it was within the project study area. The average volume of ATR station P-72 and ATR station P-54 was also considered when determining the design hour volume. After sorting the volumes from greatest to least, the dates were analyzed to confirm there was not a holiday or special event which caused the volumes to be higher on that particular day. The results of this review indicated that the most reasonable high-volume hour occurred from 5:00-6:00 P.M. on Friday, November 3. This window of time fell between the 30th and 100th highest hours of the average of station P-72 and P-54 data set and was the 32nd highest hour with consideration of ATR station P-54 solely. Stantec proposed to use Friday, November 3, 2017 due to the fact it occurs on a weekday and is not affected by a notable holiday or major event in the study area during that week. It should be noted that the 30th and 31st highest hours fell within a holiday week, therefore the 32nd hour was chosen as the design hour volume. The selected Friday, though not a typical weekday, is not a holiday itself and falls in the desired 30th to 100th highest hour of ATR stations P-72 and P-54.

The majority of typical weekday hours within the 30th to 100th highest hour were influenced by events and holidays, most notably Easter and Spring Break. The other peak hours found in the top 100 fell on Saturdays and Sundays, which are not desirable because they are weekends. Stantec proposed to use the PM peak (5:00-6:00 PM) hours of this day in the traffic analysis for the I-26 widening between MM 187 and MM 194. At ATR station P-54 the eastbound direction served 2,470 cars, while the westbound served 2,439 cars



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from 5:00-6:00 PM. The two-way hourly volume at this station (4,909) represents approximately 8.0% of the daily traffic on that day (61,558) and approximately 10.0% of the average annual daily traffic for the year (49,200). ATR station P-72 served 2,065 cars in the eastbound direction and 2,144 cars in the westbound direction from 3:00-4:00 PM. The two-way hourly volume at this station (4,209) represents approximately 7.9% of the daily traffic on that day (53,573) and approximately 10.0% of the average annual daily traffic for the year (42,400).

On this particular day the AM peak hour did not fall within the 30th and 100th highest hour of ATR stations P-72 and P-54. The results of the review for the AM Peak period indicated that the most reasonable high-volume hour occurred from 10:00-11:00 AM on Friday, June 16. This selected date was chosen as it occurs on a weekday and is not affected by a notable holiday or major event in the study area. Therefore, this was the chosen design hour volume to be used for the AM peak period in the traffic analysis for the I-26 widening between MM 187 and MM 194. At ATR station P-54 the eastbound direction served 1,695 cars while the westbound served 2,041 cars from 10:00-11:00 AM. The two-way hourly volume at this station (3,736) represents approximately 6.0% of the daily traffic on that day (62,745) and approximately 7.6% of the average annual daily traffic for the year (49,200). ATR station P-72 served 1,421 cars in the eastbound direction and 1,843 cars in the westbound direction from 10:00-11:00 AM. The two-way hourly volume at this station (3,264) represents approximately 6.0% of the daily traffic on that day (54,818) and approximately 7.7% of the average annual daily traffic for the year (42,400).

5.3 DETERMINE & APPLY ADJUSTMENT FACTOR(S)

Therefore, the AM design hour was selected as 10:00 – 11:00 AM on Friday, June 16th, 2017:

AM EB Volume

1,695 veh/hr

AM WB Volume

2,041 veh/hr

AM Two-Way Volume

3,736 veh/hr

The PM design hour was selected as 5:00 – 6:00 PM on Friday, November 3rd, 2017:

PM EB Volume

2,470 veh/hr

PM WB Volume

2,439 veh/hr

PM Two-Way Volume

4,909 veh/hr

Stantec performed daily counts from Wednesday, May 9th, 2018 to Tuesday May 15th, 2018 along I-26 at two locations – (1) between Jedburg Road and Volvo Car Drive and (2) between SC 27 and SC 453. The location (1) between Jedburg Road and Volvo Car Drive coincided with the location of ATR Station P-54 and was therefore compared with the ATR design hour counts to establish a design hour factor. Stantec's Friday (5/11/18) counts from this location were reviewed to determine the 10:00 – 11:00 AM hourly volume (EB: 1,693 | WB: 1,984 | Two-Way: 3,677 veh/hr) and the 5:00 – 6:00 PM hourly volume (EB: 2,066 | WB: 2,393 | Two-Way: 4,459 veh/hr).

The AM and PM ratios of the two-way design hour volumes to the two-way Stantec performed counts during these comparable hours of the Friday count are 1.02 and 1.10, respectively. These factors were therefore applied to the AM and PM Stantec counts along I-26 to achieve mainline design hour 2018 existing volumes.



5.4 APPLY LINEAR ANNUAL GROWTH RATES

Once the appropriate existing traffic counts were adjusted, linear annual growth rates were estimated to project 2023 and 2043 future year traffic volumes along the I-26 corridor and for the three, existing cross-streets in the study area. Distinct growth rates were estimated for four segments along I-26 (Nexton Pkwy to Jedburg Rd, Jedburg Rd to Volvo Car Dr, Volvo Car Dr to SC 27, and SC 27 to SC 453) and for each of the cross-streets (Jedburg Rd, SC 27, and SC 453). These growth rates were estimated using three data sources:

- (1) South Carolina Department of Transportation (SCDOT) AADT – historic data;
- (2) Charleston Area Transportation Study (CHATS) Travel Demand Model – future projection; and
- (3) South Carolina Statewide Model (SCSWM) Travel Demand Model – future projection;

For each I-26 segment and cross-street, the data from the three sources above were plotted to show the change in AADT over time. The SCDOT AADT historic data ranged from 2002 to 2017. The historic data was used to estimate future 2043 volumes using both a compound growth rate and a linear regression trendline projection of the data (shifted to align with the actual 2017 SCDOT AADT). The CHATS model projections to the year 2043 (the design year for this project) were also plotted on the same chart. Given that the CHATS model has a base year of 2015 and a future year of 2040, the change in AADT from 2015 to 2040 was assumed to be linear and extrapolated to the 2043 design year. Finally, the SCSWM projections to the year 2043 were plotted on the same chart as well. Given that the SCSWM has a base year of 2015 and a future year of 2045, the change in AADT from 2015 to 2045 was assumed to be linear and interpolated for the 2043 design year. For both the CHATS and SCSWM projections, the linear projections were shifted to align the 2015 base-year AADTs with the actual 2015 SCDOT AADTs.

Upon plotting this data, several observations about the CHATS model projections in this study area raised questions as to the appropriateness of including them in the growth rate estimation process. Taking these into consideration (discussed in further detail in subsequent sections of the memo) and recognizing that the study area is adjacent to and extends beyond the CHATS model boundary, it was determined to not include the CHATS projections in the estimation of future 2043 AADT along the roadway segments in question. Furthermore, upon plotting the compound annual growth projections of the historic data, it was observed that the projections appeared to overestimate future growth, especially considering the relatively long timeframe being considered (26 years). Typically, compound annual growth projections are more suitable for more near-term design years. Therefore, compound annual growth projections from the historic data were not included in the estimation of the 2043 AADT.

Therefore, two projection methods were ultimately utilized to estimate 2043 AADT:

- (1) Linear regression trendline of the 2002-2017 historic data extrapolated to the year 2043; and
- (2) SCSWM 2045 AADT projections interpolated for the year 2043.

The average of the 2043 AADT from the two projection methods was taken as the estimated 2043 AADT for each segment, respectively. The difference between these estimated 2043 AADTs and the actual 2017 SCDOT AADTs was then used to estimate a linear annual growth rate (using the 2017 SCDOT AADT as the baseline).



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These procedures led to the selection of proposed linear traffic growth rates for the freeway segments along I-26 of **2.50%** between Nexton Parkway and Jedburg Road, **2.50%** between Jedburg Road and Volvo Car Drive, **1.75%** between Volvo Car Drive and SC 27, and **1.50%** between SC 27 and SC 453. These proposed growth rates will be applied to mainline volumes within the study area to generate the design year peak hour volumes. The growth rate of traffic for cross-streets along the corridor was also estimated using the same procedures as previously mentioned. This led to the selection of proposed linear annual traffic growth rates of **1.5%** for Jedburg Road, **1.75%** for SC 27, and **1.00%** for SC 453. It should be noted that the projections for SC 453 indicated a decline in AADT through 2043; however, in an effort to be conservative, a 1.00% growth rate for this cross-street was selected. These proposed growth rates will be applied to cross-street volumes within the study area to generate the design year peak hour volumes. The proposed growth rates and corresponding estimated design year AADTs are shown in Table 4.

Table 4 – I-26 Corridor and Cross-Street Existing AADT and Estimated 2043 AADT

I-26 Segment Description	2017 AADT	Proposed Growth Rate	Estimated 2043 AADT
Nexton Pkwy to Jedburg Rd (<i>SCDOT Station 2181</i>)	61,800	2.50%	101970
Jedburg Rd to Volvo Car Dr (<i>SCDOT Station 2179</i>)	49,100	2.50%	81015
Volvo Car Dr to SC 27 (<i>SCDOT Station 2179</i>)	49,100	1.75%	71441
SC 27 to SC 453 (<i>SCDOT Station 2177</i>)	40,500	1.50%	56295
Cross-Street Description	2017 AADT	Proposed Growth Rate	Estimated 2043 AADT
Jedburg Rd (N. of I-26)	8,400	1.50%	11,676
Jedburg Rd (S. of I-26)	12,600		17,514
SC 27 (N. of I-26)	2,600	1.75%	3,783
SC 27 (S. of I-26)	10,100		14,696
SC 453 (N. of I-26)	4,400	1.00%	5,544
SC 453 (S. of I-26)	4,600		5,796

The following sections detail the processes employed to reach the aforementioned proposed linear annual growth rates for the I-26 corridor and cross-streets.



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5.4.1 I-26 Corridor Growth Rate Analysis

5.4.1.1 Historic AADT Evaluation

An evaluation of the historic AADT volumes for each of the segments along the I-26 corridor within the study area was performed. The historic (2002 to 2017) AADT at each of the relevant SCDOT count stations along I-26 are shown below in Table 5, along with the corresponding 15-year Compound Annual Growth Rates and Linear Regression equations for the historic data. The linear regression projections were shifted so that the 2017 value of the linear trendline equaled the 2017 SCDOT AADT. The magnitude of this shift is given in the final term in each of the linear regression equations. AADT projections using these compound annual growth rates and linear regressions are plotted in Figure 20 for the Nexton Pkwy to Jedburg Rd segment, Figure 21 for the Jedburg Rd to Volvo Car Dr segment, Figure 22 for the Volvo Car Dr to SC 27 segment, and Figure 23 for the SC 27 to SC 453 segment.

Table 5 – Historic Freeway Segment AADT (SCDOT)

Year	I-26 Segment			
	Nexton Pkwy to Jedburg Rd	Jedburg Rd to Volvo Car Dr*	Volvo Car Dr to SC 27*	SC 27 to SC 453
	Berkeley County SCDOT Count Station 2181	Berkeley County SCDOT Count Station 2179	Berkeley County SCDOT Count Station 2179	Dorchester County SCDOT Count Station 2177
2002	38,500	32,500	32,500	27,000
2003	41,500	34,100	34,100	28,800
2004	41,700	35,600	35,600	29,900
2005	43,000	36,600	36,600	30,100
2006	44,900	37,800	37,800	30,900
2007	46,500	38,900	38,900	32,300
2008	45,700	37,700	37,700	31,500
2009	45,700	37,600	37,600	31,400
2010	48,300	38,900	38,900	32,800
2011	48,200	38,300	38,300	32,100
2012	47,700	37,800	37,800	31,700
2013	49,800	38,700	38,700	32,300
2014	52,000	39,900	39,900	34,400
2015	56,300	43,600	43,600	37,000
2016	59,300	47,000	47,000	39,300
2017	61,800	49,100	49,100	40,500
15-Year Compound Annual Growth Rate	3.21%	2.79%	2.79%	2.74%
Linear Regression Equation	$y = 1,284x - 2,531,367 + 3,984$	$y = 792x - 1,551,749 + 4,152$	$y = 792x - 1,551,749 + 4,252$	$y = 685x - 1,343,883 + 2,738$

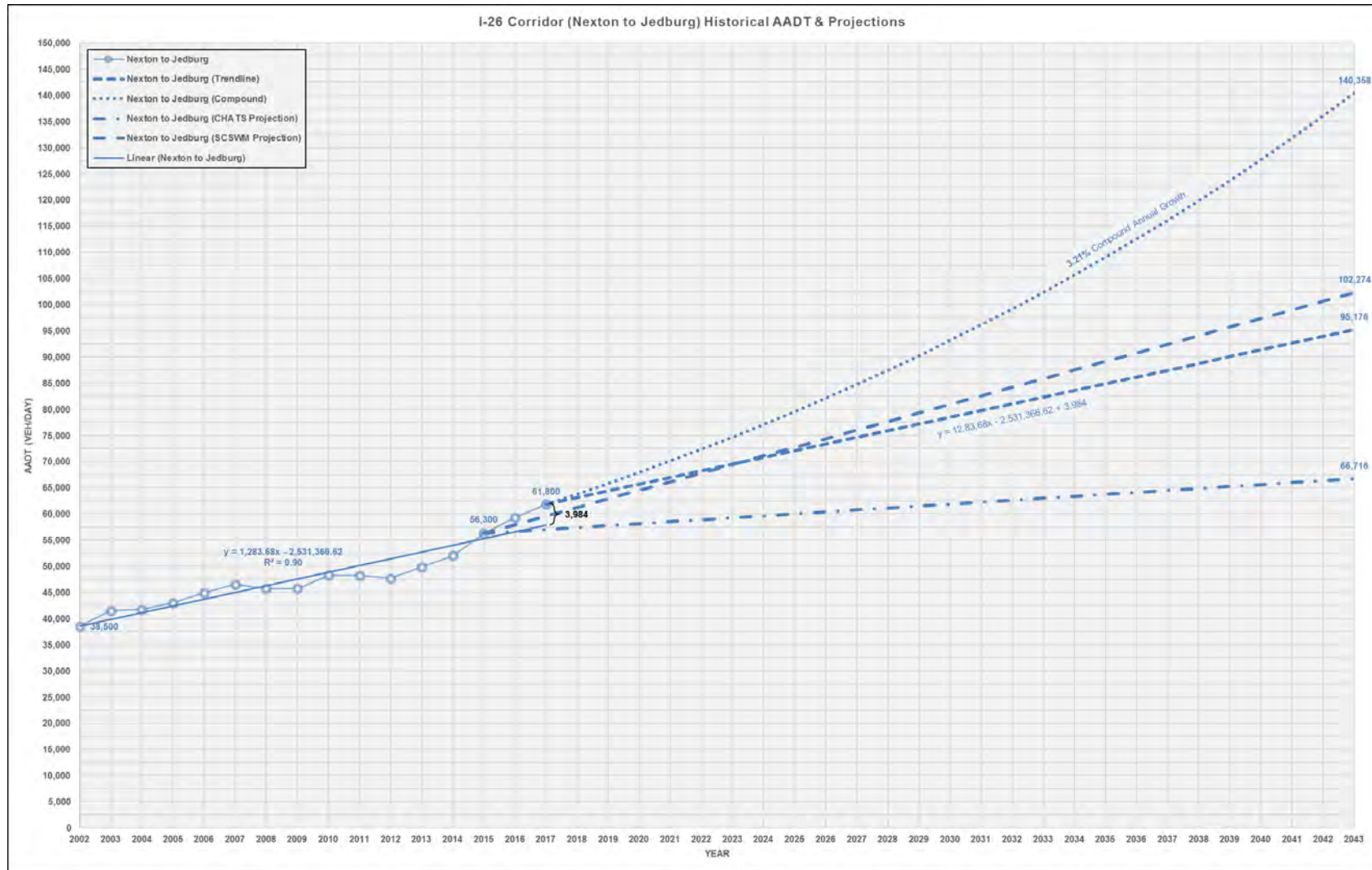
* Historic AADT for these two segments are identical as the Volvo Car Dr interchange is currently under construction.



I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

Traffic Volume Forecasting
June 2019

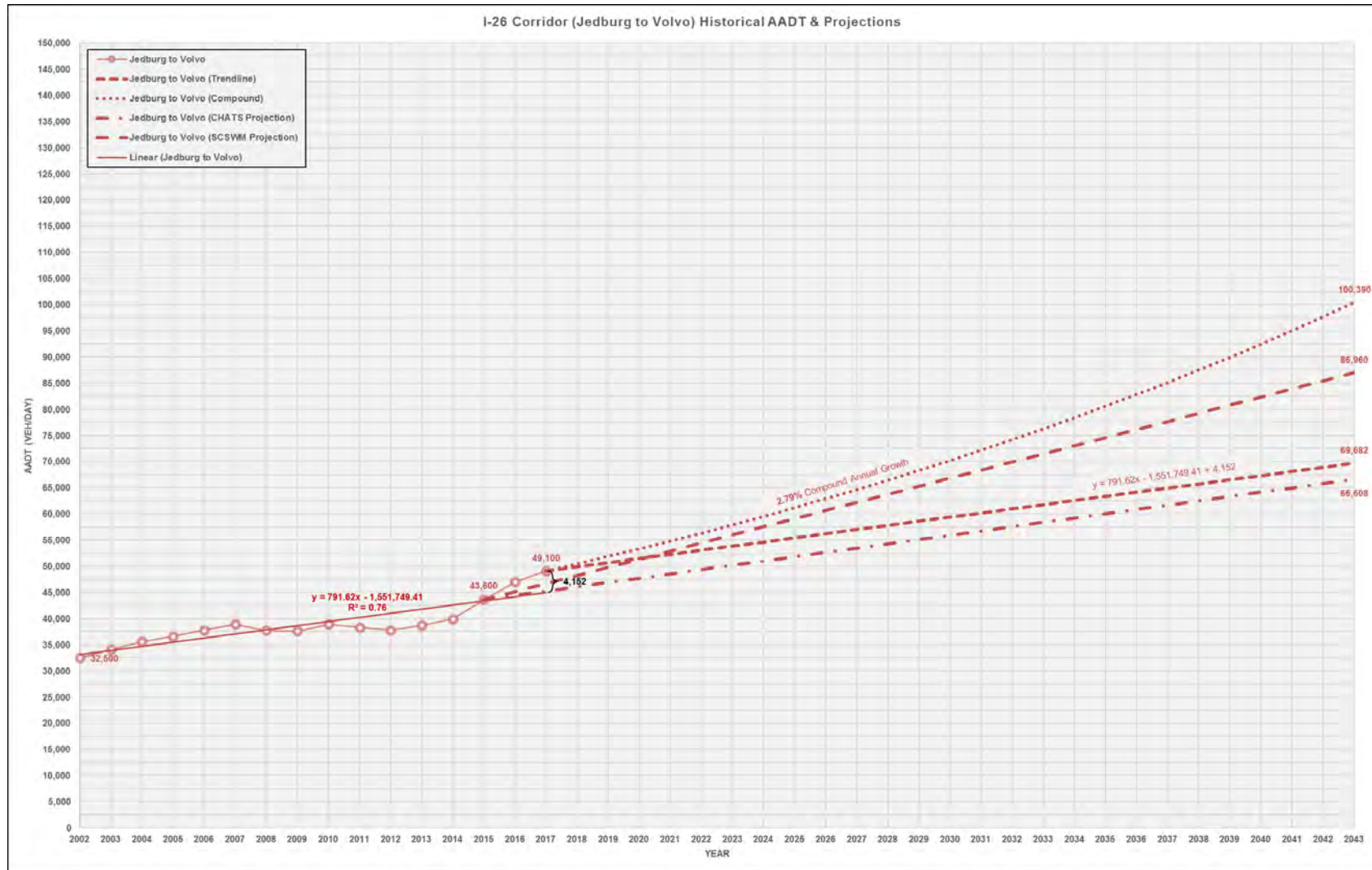
Figure 20 – I-26 (Nexton to Jedburg) Historic SCDOT AADT and Projected AADT



I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

Traffic Volume Forecasting
June 2019

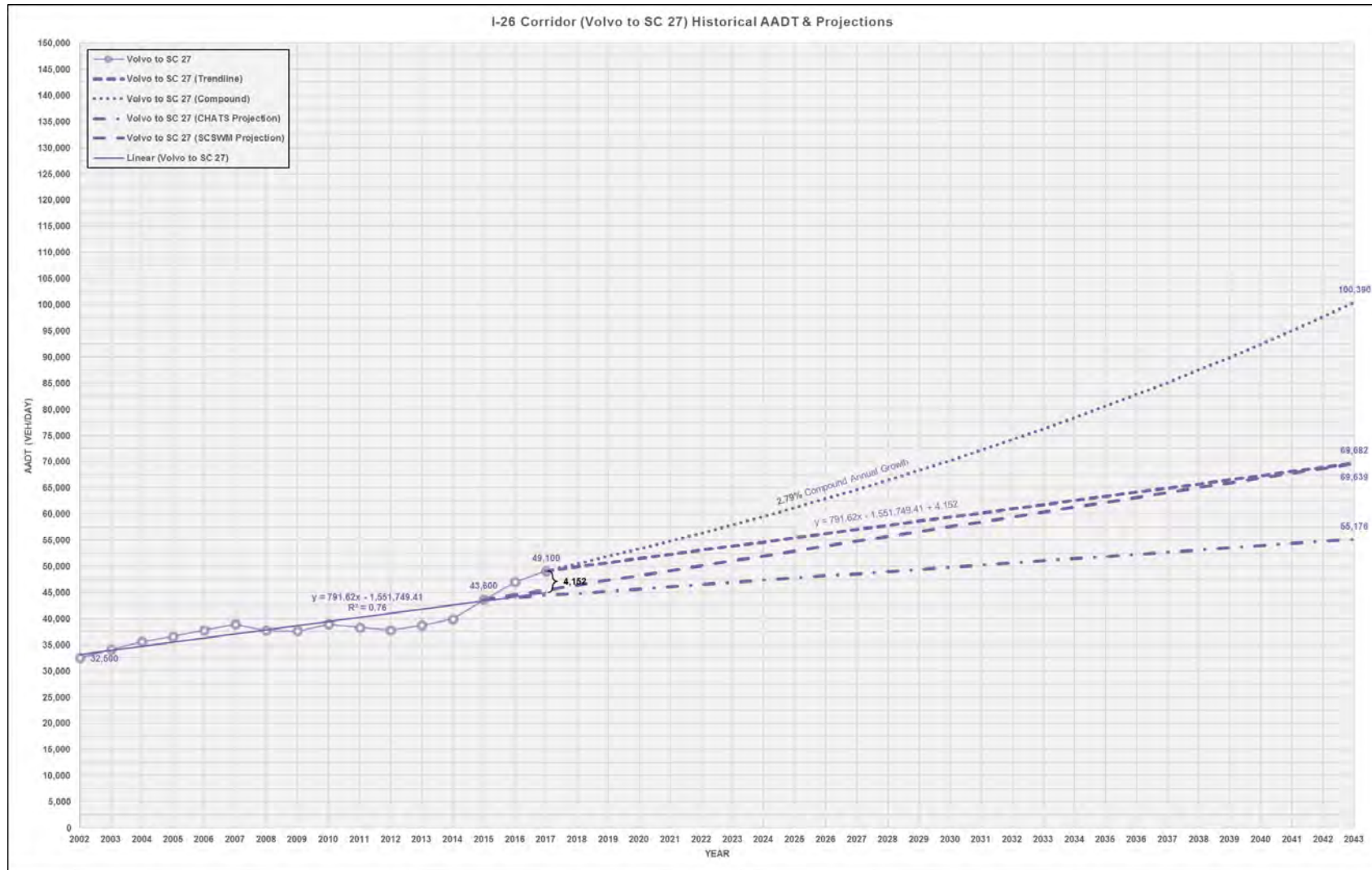
Figure 21 – I-26 (Jedburg to Volvo) Historic SCDOT AADT and Projected AADT



I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

Traffic Volume Forecasting
June 2019

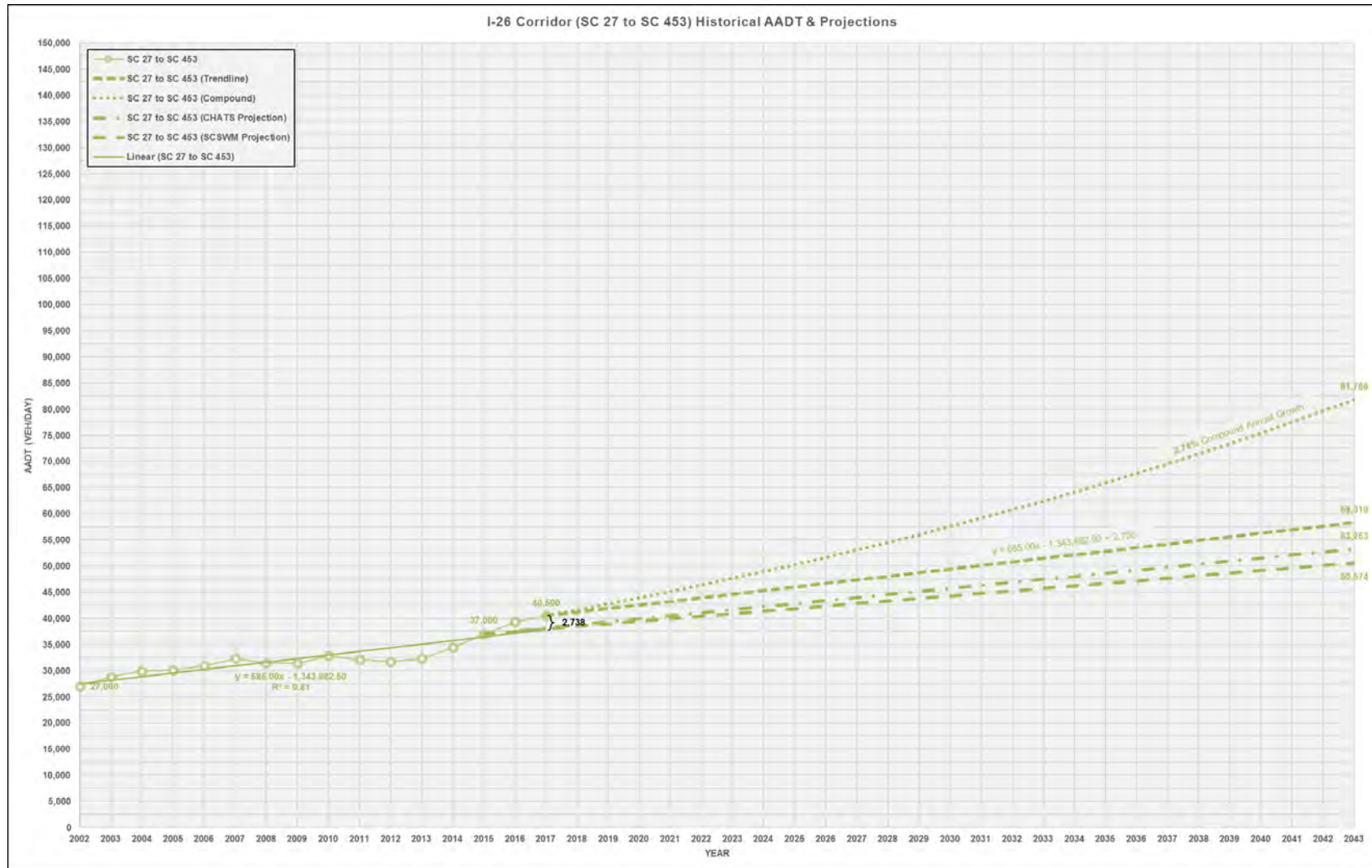
Figure 22 – I-26 (Volvo to SC 27) Historic SCDOT AADT and Projected AADT



I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

Traffic Volume Forecasting
June 2019

Figure 23 – I-26 (SC 27 to SC 453) Historic SCDOT AADT and Projected AADT



I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

Traffic Volume Forecasting
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5.4.1.2 South Carolina Statewide Model (SCSWM) Projection Evaluation

Traffic assignments for the 2015 and 2045 base SCSWM networks were obtained from the model, as shown in columns 3 and 4 of Table 6 below.

Table 6 – SCSWM Projected I-26 AADTs

1	2	3	4	5	6	7	8
Segment	I-26 Segment Description	SCSWM 2015 Base AADT	SCSWM 2045 Projected AADT	SCDOT 2015 AADT	SCSWM AADT Adjustment	SCSWM 2045 Adjusted Projected AADT	SCSWM 2043 Interpolated AADT
1	Nexton Pkwy to Jedburg Rd	47,749	97,007	56,300	+8,551	105,558	102,274
2	Jedburg Rd to Volvo Car Dr	40,518	86,975	43,600	+3,082	90,057	86,960
3	Volvo Car Dr to SC 27	40,518	68,417	43,600	+3,082	71,499	69,639
4	SC 27 to SC 453	33,795	48,339	37,000	+3,205	51,544	50,574

To confirm its accuracy, the SWCWM 2015 base year AADT of the segments in question were compared with the respective SCDOT 2015 AADTs. This revealed differences (shown in column 6 of Table 6) between the two AADTs with percent differences ranging from roughly 7% to 16%. Therefore, the SCSWM AADT's were adjusted to align with the 2015 SCDOT AADTs for each segment. The resulting SCSWM 2045 projected, adjusted AADTs for each segment are shown in column 7. The growth projected in the SCSWM from the 2015 base year to the 2045 future year was assumed to be linear. Therefore, the 2043 SCSWM projected AADT was linearly interpolated for each segment, as shown in column 8 of Table 6. These 2043 AADT projections along the I-26 corridor are plotted in Figure 20 for the Nexton Pkwy to Jedburg Rd segment, Figure 21 for the Jedburg Rd to Volvo Car Dr segment, Figure 22 for the Volvo Car Dr to SC 27 segment, and Figure 23 for the SC 27 to SC 453 segment.



I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

Traffic Volume Forecasting

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5.4.1.3 Charleston Area Transportation Study (CHATS) Projection Evaluation

Traffic assignments for the 2015 and 2040 base CHATS networks were obtained from the model, as shown in columns 3 and 4 of Table 7 below.

Table 7 – CHATS Projected I-26 AADTs

1	2	3	4	5	6	7	8
Segment	I-26 Segment Description	CHATS 2015 Base AADT	CHATS 2040 Projected AADT	SCDOT 2015 AADT	CHATS AADT Adjustment	CHATS 2040 Adjusted Projected AADT	CHATS 2043 Extrapolated AADT
1	Nexton Pkwy to Jedburg Rd	49,536	60,696	56,300	+6,764	65,972	66,716
2	Jedburg Rd to Volvo Car Dr	39,808	64,459	43,600	+3,792	64,964	66,608
3	Volvo Car Dr to SC 27	39,808	52,211	43,600	+3,792	54,349	55,176
4	SC 27 to SC 453	37,991	55,405	37,000	-991	52,092	53,253

To confirm its accuracy, the CHATS 2015 base year AADT of the segments in question were compared with the respective SCDOT 2015 AADTs. This revealed differences (shown in column 6 of Table 4) between the two AADTs with percent differences ranging from roughly 3% to 13%. Therefore, the CHATS AADTs were adjusted to align with the 2015 SCDOT AADTs for each segment. The resulting CHATS 2040 projected, adjusted AADTs for each segment are shown in the fifth column. The growth projected in the CHATS from the 2015 base year to the 2040 future year was assumed to be linear. Therefore, the 2043 CHATS projected AADT was linearly extrapolated for each segment, as shown in column 8 of Table 7.

Several observations were made concerning the CHATS 2043 extrapolated AADTs from this exercise. The unadjusted CHATS 2040 projected AADT for Segment 1 is 60,696, lower than the 2017 historic SCDOT AADT along this segment (61,800). Additionally, it was expected that the projected AADT for Segment 2 would be lower than that for Segment 1. However, the unadjusted CHATS 2040 projected AADTs show the opposite pattern. Based on these observations, it was determined that the CHATS 2043 projections would not be taken into account when estimating future 2043 AADT for the segments along I-26. Also, to remain consistent, the 2043 CHATS projections for the Jedburg Rd, SC 27, and SC 453 cross-streets were also not considered when estimating the 2043 AADT for those segments.

While not considered in the 2043 AADT estimation process, the 2043 CHATS AADT projections along the I-26 corridor are plotted for comparison in Figure 20 for the Nexton Pkwy to Jedburg Rd segment, Figure 21 for the Jedburg Rd to Volvo Car Dr segment, Figure 22 for the Volvo Car Dr to SC 27 segment, and Figure 23 for the SC 27 to SC 453 segment.



I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

Traffic Volume Forecasting
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5.4.1.4 Proposed I-26 Corridor Growth Rates

The two projection methods utilized to estimate 2043 AADT along the four distinct segments of I-26 were:

- (1) Linear regression trendline of the 2002-2017 historic data extrapolated to the year 2043; and
- (2) SCSWM 2045 AADT projections interpolated for the year 2043.

The average of the 2043 AADT from the two projection methods was taken as the estimated 2043 AADT for each segment, respectively. The difference between these estimated 2043 AADTs and the actual 2017 SCDOT AADTs was then used to estimate a linear annual growth rate (using the 2017 SCDOT AADT as the baseline). The 2017 SCDOT AADT was selected as the baseline year from which to derive the linear annual growth rate, as it was the base year for the linear regression analysis (after it was shifted), and the SCDOT AADT information was utilized to shift the SCSWM model projections. Additionally, the project interstate and intersection peak hour counts were collected in 2018, making the 2017 SCDOT AADT counts the most recent available counts on which to base the annual growth rate. The 2017 SCDOT AADT and average 2043 projected AADT (of both projections) are shown below in Table 8.

Table 8 – 2043 AADT Projections and Linear Annual Growth Rates

Segment	I-26 Segment Description	2017 SCDOT AADT	2043 Projected AADT (linear regression)	2043 Projected AADT (SCSWM projection)	Average 2043 Projected AADT	Linear Annual Growth Rate (%)	Linear Annual Growth Rate Rounded Up To nearest 0.25%
1	Nexton Pkwy to Jedburg Rd	61,800	95,176	102,274	98,725	2.30%	2.50%
2	Jedburg Rd to Volvo Car Dr	49,100	69,682	86,960	78,321	2.29%	2.50%
3	Volvo Car Dr to SC 27	49,100	69,682	69,639	69,661	1.61%	1.75%
4	SC 27 to SC 453	40,500	58,310	50,574	54,442	1.32%	1.50%

The difference between the 2017 SCDOT AADT and the average 2043 projected AADT yielded linear annual growth rates (over the 26 period) along I-26 of 2.30% per year between Nexton Parkway and Jedburg Road, 2.29% between Jedburg Road and Volvo Car Drive, 1.61% between Volvo Car Drive and SC 27, and 1.32% between SC 27 and SC 453.

In an effort to be conservative, each of the aforementioned growth rates were rounded up to the nearest 0.25%, yielding growth rates of **2.50%**, **2.50%**, **1.75%**, and **1.50%** for Segments 1 through 4, respectively. These proposed growth rates were applied to mainline volumes within the study area to generate the design year peak hour volumes.



I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

Traffic Volume Forecasting

June 2019

5.4.2 Cross-Street Growth Rate Analysis

5.4.2.1 Historic AADT Evaluation

An evaluation of the historic AADT volumes for each of the segments along the I-26 corridor within the study area was performed. The historic (2002 to 2017) AADT at each of the relevant SCDOT count stations at the cross-streets are shown in Table 9, along with the corresponding 15-year Compound Annual Growth Rates and Linear Regression equations for the historic data (for the average of stations north and south of I-26 along each cross-street). The linear regression projections were shifted so that the 2017 value of the linear trendline equaled the 2017 SCDOT AADT. The magnitude of this shift is given in the final term in the regression equations. AADT projections using these compound annual growth rates and linear regressions are plotted in Figure 24 for Jedburg Rd, Figure 25 for SC 27, and Figure 26 for the SC 453.

Table 9 – Historic Cross-Street AADT (SCDOT)

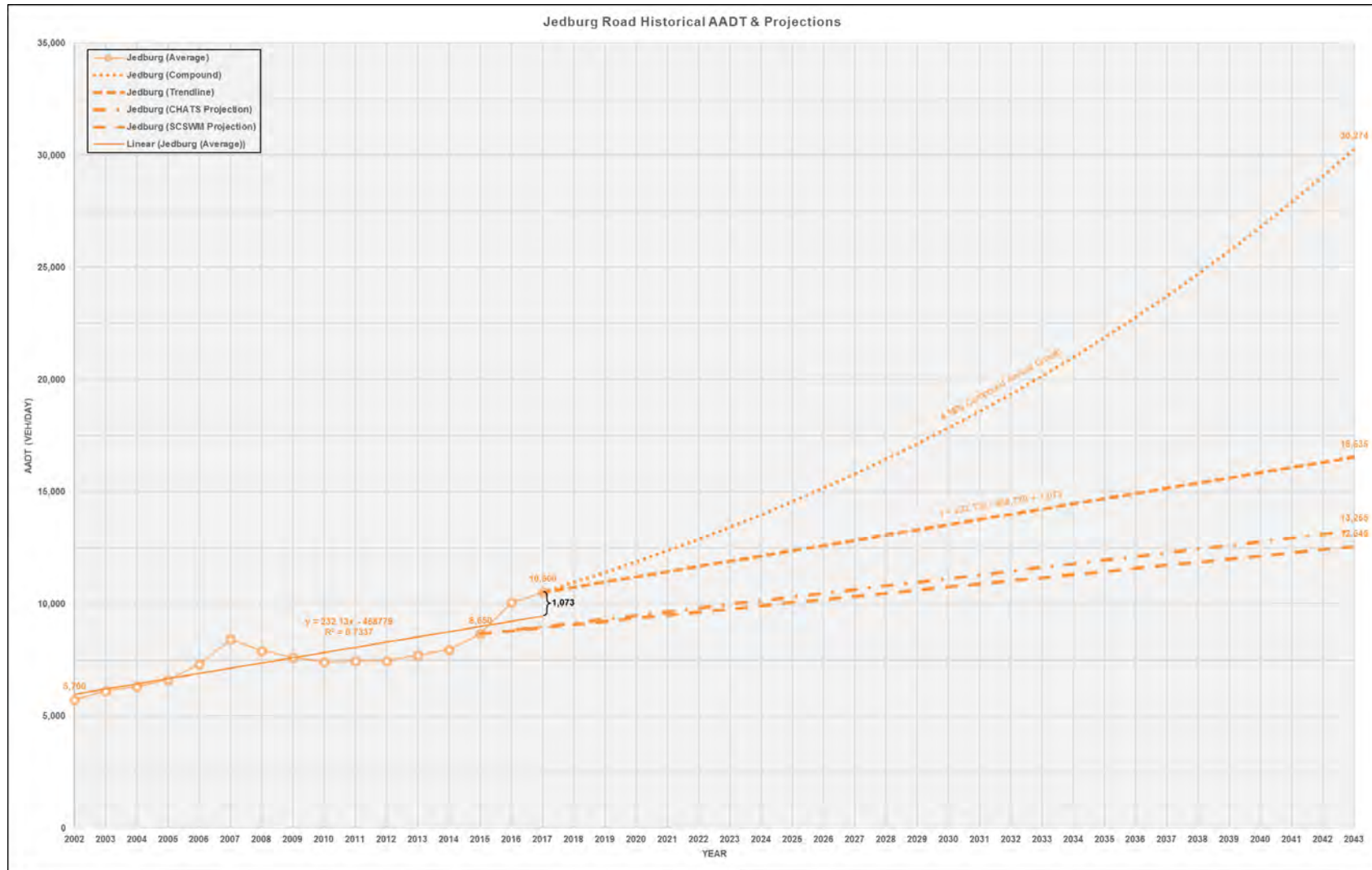
Year	Cross-Street								
	Jedburg Road (N. of I-26) Berkeley	Jedburg Road (S. of I-26) Dorchester	Jedburg Road (Avg.)	SC 27 (N. of I-26) Berkeley	SC 27 (S. of I-26) Dorchester	SC 27 (Avg.)	SC 453 (N. of I-26) Berkeley	SC 453 (S. of I-26) Dorchester	SC 453 (Avg.)
2002	5,500	5,900	5,700	1,600	6,400	4,000	5,700	4,300	5,000
2003	6,000	6,200	6,100	1,650	7,600	4,625	5,800	4,500	5,150
2004	5,600	7,000	6,300	1,900	7,500	4,700	5,300	4,400	4,850
2005	5,500	7,700	6,600	1,450	7,400	4,425	5,200	4,700	4,950
2006	6,200	8,400	7,300	1,950	7,500	4,725	5,400	4,300	4,850
2007	7,000	9,800	8,400	1,950	7,700	4,825	5,900	4,800	5,350
2008	5,900	9,900	7,900	1,950	7,900	4,925	5,600	4,900	5,250
2009	6,000	9,200	7,600	1,950	7,100	4,525	4,300	4,400	4,350
2010	5,400	9,400	7,400	1,900	7,200	4,550	4,400	4,500	4,450
2011	5,500	9,400	7,450	2,300	6,900	4,600	4,700	4,600	4,650
2012	5,100	9,800	7,450	2,000	7,500	4,750	5,000	4,600	4,800
2013	5,200	10,200	7,700	2,200	6,700	4,450	5,300	4,900	5,100
2014	5,200	10,700	7,950	1,900	8,400	5,150	4,100	4,200	4,150
2015	7,100	10,200	8,650	2,000	7,200	4,600	3,800	4,100	3,950
2016	8,300	11,800	10,050	2,400	10,300	6,350	3,500	4,600	4,050
2017	8,400	12,600	10,500	2,600	10,100	6,350	4,400	4,600	4,500
15-Year Compound Annual Growth Rate	4.16%			3.13%			-0.70%		
Linear Regression Equation	$y = 232x - 458,779 + 1,073$			$y = 88x - 172,019 + 843$			$y = -61x + 127,647 + 245$		



I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

Traffic Volume Forecasting
June 2019

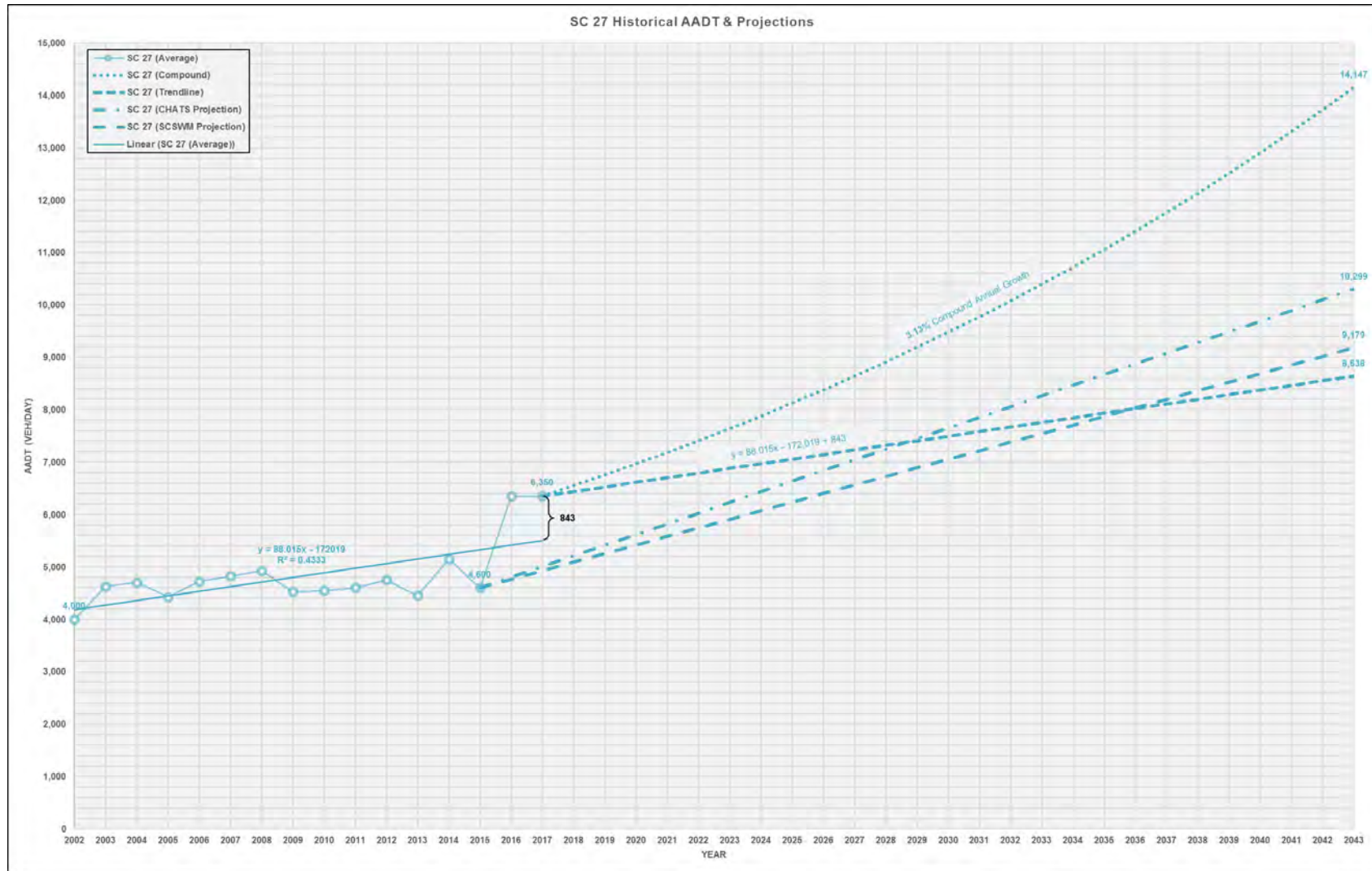
Figure 24 – Jedburg Road Historic SCDOT AADT and Projected AADT



I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

Traffic Volume Forecasting
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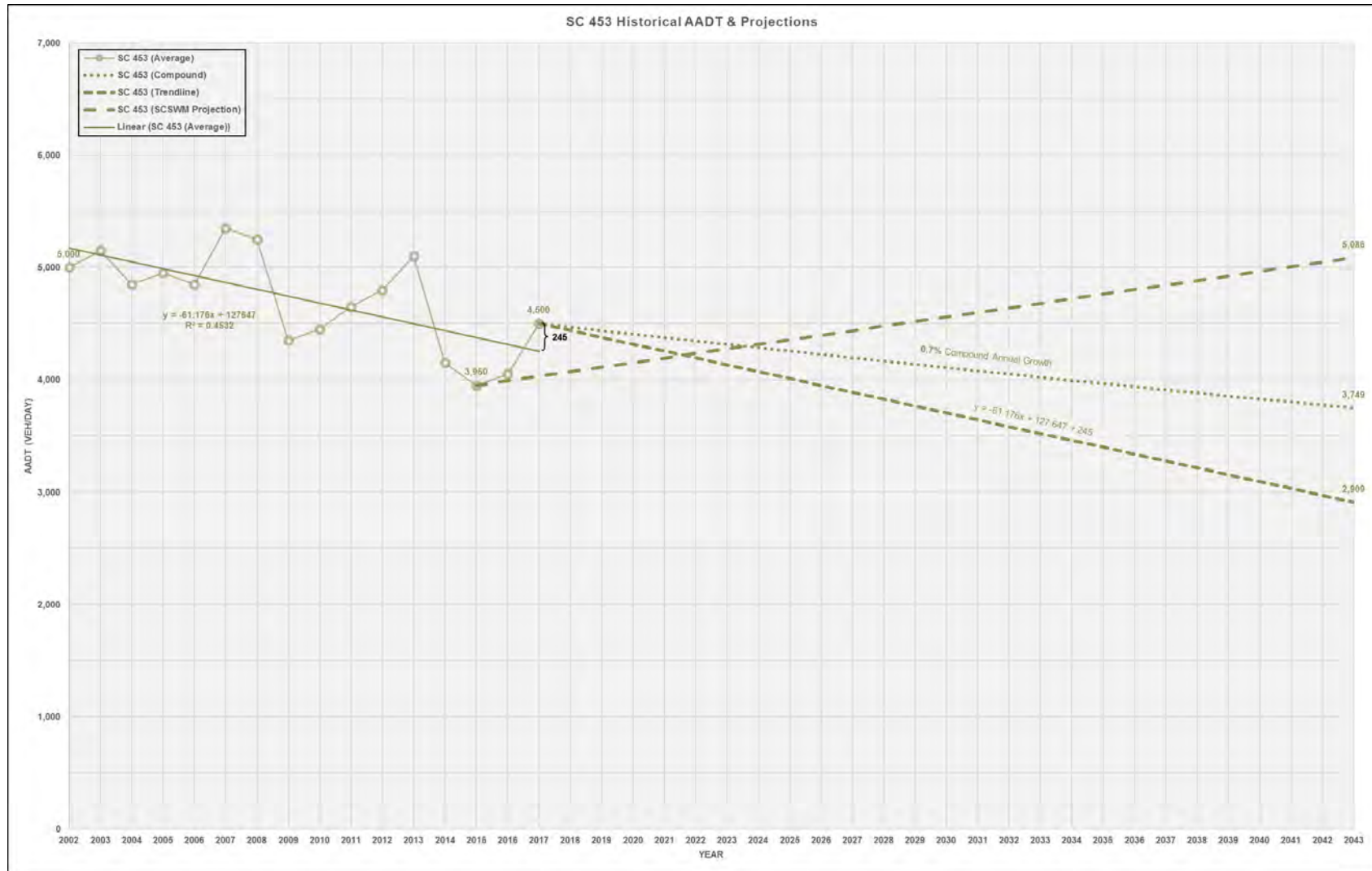
Figure 25 – SC 27 Historic SCDOT AADT and Projected AADT



I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

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Figure 26 – SC 453 Historic SCDOT AADT and Projected AADT



I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

Traffic Volume Forecasting

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5.4.2.2 South Carolina Statewide Model (SCSWM) Projection Evaluation

Traffic assignments for the 2015 and 2045 base SCSWM networks were obtained from the model, as shown in the columns 2 and 3 of Table 10 below. The averages of the segments in question were used for comparison with the average of historical AADTs of the segments north and south of I-26 along each cross-street.

Table 10 – Historic Cross-Street AADT (SCDOT)

1	2	3	4	5	6	7
Cross-Street Description	SCSWM 2015 Base AADT	SCSWM 2045 Projected AADT	SCDOT 2015 AADT	SCSWM AADT Adjustment	SCSWM 2045 Adjusted Projected AADT	SCSWM 2043 Interpolated AADT
Jedburg Rd (N. of I-26)	6,330	14,765	7,100			
Jedburg Rd (S. of I-26)	10,014	9,925	10,200			
Jedburg Rd* (Avg. of N. & S. Segments)	8,172	12,345	8,650	+478	12,823	12,545
SC 27 (N. of I-26)	1,987	2,729	2,000			
SC 27 (S. of I-26)	8,405	17,475	7,200			
SC 27* (Avg. of N. & S. Segments)	5,196	10,102	4,600	-596	9,506	9,179
SC 453 (N. of I-26)	4,538	5,486	3,800			
SC 453 (S. of I-26)	3,992	5,479	4,100			
SC 453* (Avg. of N. & S. Segments)	4,265	5,483	3,950	-315	5,167	6,086

To confirm its accuracy, the SWCWM 2015 base year AADT of the cross-streets in question were compared with the respective SCDOT 2015 AADTs. This revealed differences (shown in column 5 of Table 10) between the two AADTs with percent differences ranging from roughly 6% to 12%. Therefore, the SCSWM AADT's were adjusted to align with the 2015 SCDOT AADTs for each segment. The resulting SCSWM 2045 projected, adjusted AADTs for each segment are shown in the fifth column. The growth projected in the SCSWM from the 2015 base year to the 2045 future year was assumed to be linear. Therefore, the 2043 SCSWM projected AADT was linearly interpolated for each segment, as shown in column 7 of Table 10.

These 2043 AADT projections using these compound annual growth rates and linear regressions are plotted in Figure 24 for Jedburg Rd, Figure 25 for SC 27, and Figure 26 for the SC 453.



I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

Traffic Volume Forecasting

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5.4.2.3 Charleston Area Transportation Study (CHATS) Projection Evaluation

Traffic assignments for the 2015 and 2040 base CHATS networks were obtained from the model, as shown in the columns 2 and 3 of Table 11 below. The averages of the segments in question were used for comparison with the average of historical AADTs of the segments north and south of I-26 along each cross-street.

Table 11 – CHATS Projected Cross Street AADTs

1	2	3	4	5	6	7
Cross-Street Description	CHATS 2015 Base AADT	CHATS 2045 Projected AADT	SCDOT 2015 AADT	CHATS AADT Adjustment	CHATS 2040 Adjusted Projected AADT	CHATS 2043 Extrapolated AADT
Jedburg Rd (N. of I-26)	8,084	15,252	7,100			
Jedburg Rd (S. of I-26)	10,281	12,981	10,200			
Jedburg Rd** (Avg. of N. & S. Segments)	9,183	14,117	8,650	-533	12,761	13,255
SC 27 (N. of I-26)	2,001	3,953	2,000			
SC 27 (S. of I-26)	13,869	24,129	7,200			
SC 27** (Avg. of N. & S. Segments)	7935	14041	4,600	-3,335	9,688	10,299
SC 453 (N. of I-26)	N/A*	N/A*	N/A*			
SC 453 (S. of I-26)	N/A*	N/A*	N/A*			
SC 453** (Avg. of N. & S. Segments)	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*

* Outside of CHATS model boundary

** 2043 projections were estimated for average of segments north and south of I-26

To confirm its accuracy, the CHATS 2015 base year AADT of the cross-streets in question were compared with the respective SCDOT 2015 AADTs. This revealed differences (shown in column 5 of Table 11) between the two AADTs with percent differences ranging from roughly 5% to 6%. Therefore, the CHATS AADT's were adjusted to align with the 2015 SCDOT AADTs for each segment. The resulting CHATS 2040 projected, adjusted AADTs for each segment are shown in the fifth column. The growth projected in the CHATS from the 2015 base year to the 2040 future year was assumed to be linear. Therefore, the 2043 CHATS projected AADT was linearly extrapolated for each segment, as shown in column 7 of Table 11.

As discussed earlier, several observations concerning the CHATS 2043 extrapolated AADTs along the I-26 corridor led to the determination that the CHATS 2043 projections would not be taken into account when estimating future 2043 AADT for the segments along I-26.

While not considered in the 2043 AADT estimation process, the 2043 CHATS AADT projections are plotted in Figure 24 for Jedburg Rd, Figure 25 for SC 27, and Figure 26 for the SC 453.



I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

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5.4.2.4 Proposed I-26 Cross-Street Growth Rates

The two projection methods utilized to estimate 2043 AADT along the three cross-streets were:

- (1) Linear regression trendline of the 2002-2017 historic data extrapolated to the year 2043; and
- (2) SCSWM 2045 AADT projections interpolated for the year 2043.

The average of the 2043 AADT from the two projection methods was taken as the estimated 2043 AADT for each cross-street, respectively. The difference between these estimated 2043 AADTs and the actual 2017 SCDOT AADTs was then used to estimate a linear annual growth rate (using the 2017 SCDOT AADT as the baseline). The 2017 SCDOT AADT was selected as the baseline year from which to derive the linear annual growth rate, as it was the base year for the linear regression analysis (after it was shifted), and the SCDOT AADT information was utilized to shift the SCSWM model projections. Additionally, the project interstate and intersection peak hour counts were collected in 2018, making the 2017 SCDOT AADT counts the most recent available counts on which to base the annual growth rate. The 2017 SCDOT AADT and average 2043 projected AADT (of both projections) are shown below in Table 12.

Table 12 – 2043 AADT Projections and Linear Annual Growth Rates

Cross-Street	2017 SCDOT AADT	2043 Projected AADT (linear regression)	2043 Projected AADT (SCSWM projection)	Average 2043 Projected AADT	Linear Annual Growth Rate (%)	Linear Annual Growth Rate Rounded Up To nearest 0.25%
Jedburg Rd (Avg. of N. & S. Segments)	10,500	16,535	12,545	14,540	1.48%	1.50%
SC 27 (Avg. of N. & S. Segments)	6,350	8,638	9,179	8,909	1.55%	1.75%
SC 453 (Avg. of N. & S. Segments)	4,500	2,909	5,086	3,998	-0.43%	1.00%

The difference between the 2017 SCDOT AADT and the average 2043 projected AADT yielded linear annual growth rates (over the 26-year period) of 1.48% per year for Jedburg Road, 1.55% for SC 27, and -0.43% for SC 453.

In an effort to be conservative, each of the aforementioned growth rates were rounded up to the nearest 0.25% (assuming a minimum growth rate of 1.00% in the case of negative projected change in volume), yielding growth rates of **1.50%**, **1.75%**, and **1.00%** for Jedburg Road, SC 27, and SC 453, respectively. These proposed growth rates will be applied to mainline volumes within the study area to generate the design year peak hour volumes.



I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

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5.4.3 Related Studies

In June of 2016, Stantec completed an interchange justification report (IJR) for the I-26 & Volvo Car Drive interchange, which is located within this widening project's study area. The methodology for the Volvo Car Drive IJR study included the development of a background growth rate for all non-Volvo-related traffic, resulting in the selection of a 2.0% linear annual growth rate for volumes along I-26 and at the cross-streets at adjacent interchanges in the study area, which included Jedburg Road and SC 27. This 2.0% background growth rate used in the I-26 & Volvo Car Drive IJR along I-26 and at SC 27 and Jedburg Road differ from the proposed growth rates along I-26, SC 27, and Jedburg Road, respectively, which resulted from the analysis described in this memo. This is due to several differences in analysis:

In the analysis of historic annual growth, the Volvo Car Drive IJR considered only SCDOT count station #2179 between SC 27 and Jedburg Road, as this was the most relevant station in the study area. However, for this widening, the study area extends beyond these boundaries, leading to the inclusion of two additional SCDOT count stations (#2177 and #2181) in the analysis of historic growth.

Additionally, the Volvo Car Drive IJR utilized historic data through the year 2014 as this was the most recent available data. This study includes three additional years of recent data through 2017. The Volvo Car Drive IJR also considered the 2.1% growth rate utilized in a May 2010 *Sheep Island Parkway IJR/Jedburg Road IMR*. While this was a recent, relevant study at the time of analysis for the Volvo Car Drive IJR, the time lapse between that study and this one, including additional recent historic growth information, as well as updates to the regional and statewide forecast models, led to the decision not to include the growth rate from the May 2010 study in the methodology to propose the background growth rates for this widening study.

Finally, in the case of the cross-streets, as mentioned previously, the Volvo Car Drive IJR study area included less area along I-26 than this widening study and therefore did not assume different growth rates for the adjacent interchanges. Stantec does, however, propose to utilize different growth rates for each of the interchange cross-streets in the study area.

For the reasons listed above, Stantec utilized the background growth rates presented in this memorandum to develop design year volumes along I-26 and at the existing study area interchanges, despite the fact that they differ from the growth rates assumed in the Volvo Car Drive IJR.

For the Volvo Car Drive interchange currently under construction, however, Stantec developed design year traffic volumes using the results of the Volvo Car Drive June 2016 IJR.



I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

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5.4.4 Summary of Growth Rates and Future AADTs

The study area of the I-26 Widening Project between MM 187 and 194 in Berkeley Counties includes three existing interchanges (Jedburg Road, SC 27, and SC 453), and one interchange currently under construction (Volvo Car Drive). This section of this report documents the processes utilized to determine the background traffic growth rates for the I-26 mainline as well as the three existing interchanges, for the purpose of developing design year traffic volumes for use in alternative analysis. Design year traffic volumes for the Volvo Car Drive interchange will be developed using the results of a June 2016 IJR. The proposed background traffic linear annual growth rates selected along I-26 are **2.50%** between Nexton Parkway and Jedburg Road, **2.50%** between Jedburg Road and Volvo Car Drive, **1.75%** between Volvo Car Drive and SC 27, and **1.50%** between SC 27 and SC 453. These proposed growth rates will be applied to mainline volumes within the study area to generate the design year peak hour volumes. The growth rate of traffic for cross-streets along the corridor were also estimated, leading to the selection of proposed linear annual traffic growth rates of **1.50%** for Jedburg Road, **1.75%** for SC 27, and **1.00%** for SC 453. It should be noted that the projections for SC 453 indicated a decline in AADT through 2043; however, in an effort to be conservative, a 1.00% growth rate for this cross-street was selected. These proposed growth rates will be applied to cross-street volumes within the study area to generate the design year peak hour volumes. The proposed growth rates and corresponding estimated design year AADTs are shown in Table 13.

Table 13 – I-26 Corridor and Cross-Street Existing AADT and Estimated 2043 AADT

I-26 Segment Description	2017 AADT	Proposed Growth Rate	Estimated 2043 AADT
Nexton Pkwy to Jedburg Rd (SCDOT Station 2181)	61,800	2.50%	101,970
Jedburg Rd to Volvo Car Dr (SCDOT Station 2179)	49,100	2.50%	81,015
Volvo Car Dr to SC 27 (SCDOT Station 2179)	49,100	1.75%	71,441
SC 27 to SC 453 (SCDOT Station 2177)	40,500	1.50%	56,295
Cross-Street Description	2017 AADT	Proposed Growth Rate	Estimated 2043 AADT
Jedburg Rd (N. of I-26)	8,400	1.50%	11,676
Jedburg Rd (S. of I-26)	12,600		17,514
SC 27 (N. of I-26)	2,600	1.75%	3,783
SC 27 (S. of I-26)	10,100		14,696
SC 453 (N. of I-26)	4,400	1.00%	5,544
SC 453 (S. of I-26)	4,600		5,796



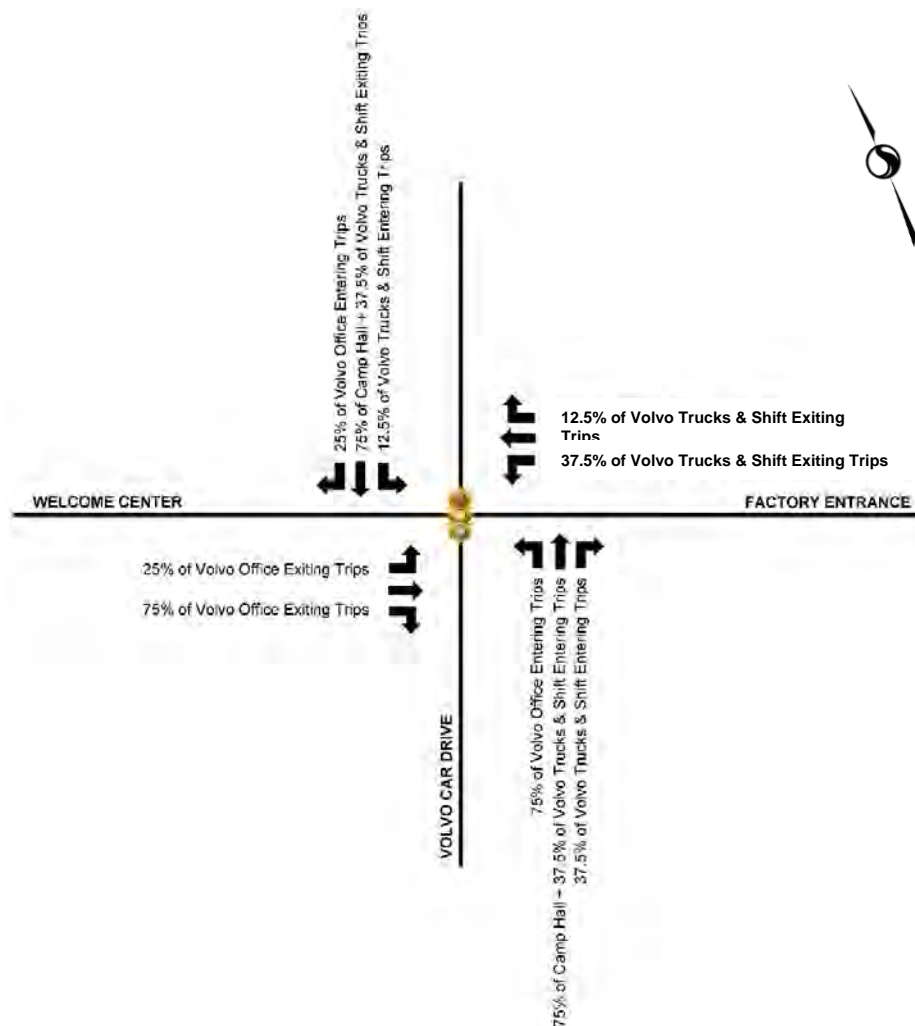
5.5 DEVELOPMENT-GENERATED TRAFFIC

5.5.1 Volvo-Related Traffic

Volumes to/from Volvo Car Drive at the new interchange (currently under construction) were included based upon the Volvo Car Drive IJR completed in 2016. On Page 13 of the IJR, the trip distribution of the trips to/from the Volvo and Camp Hall site assumed in the IJR is presented, showing:

- 15% to/from the west via I-26 (towards Orangeburg);
- 60% to/from the east via I-26 (towards Charleston);
- 3% to/from the west via US 78 and SC 27;
- 4% to/from the east via US 78 and SC 27;
- 8% to/from the west via US 176; and
- 10% to/from the east via US 176.

As to the assignment of Volvo/Camp Hall related traffic at the Welcome Center/Factory Entrance & Volvo Car Drive intersection, the trips were assigned according to the diagram below:



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In the Volvo Car Drive IJR, one peak hour (3:00 – 4:00 PM) was analyzed as this was the worst-case peak hour for Volvo related traffic. Since this I-26 widening traffic analysis considers the typical AM and PM peak periods, some additional analysis was required to extract the volumes from the IJR for these hours. Appendix A of the Volvo Car Drive IJR includes 2019 and 2039 land uses and trips generated by land use and their peak hours of generation. This information was used to create a schedule of trips for the 2019 and 2039 analysis years considered in the Volvo Car Drive IJR (these are included in Appendix A.15). The AM and PM peak hour trips generated by the Volvo and Camp Hall sites were determined from this schedule and assigned to the intersection and ramps associated with the Volvo Car Drive interchange. These 2019 and 2039 volumes were grown up to the 2023 and 2043 analysis years of this widening traffic study using the 2% linear annual growth rate that was assumed in the Volvo Car Drive IJR.

5.5.2 Ridgeville Industrial Site Related Traffic

On March 21st, 2019, the I-26 Widening project team (SCDOT, Mead & Hunt, and Stantec) met with representatives from the South Carolina State Ports Authority (SCSPA) to discuss the anticipated truck traffic trip generation of the Ridgeville industrial site, to be located west of the I-26 & SC 27 interchange. The trip generation potential of the site is of particular significance to the project as the considerable majority of trips to/from the site are anticipated to use the I-26 & SC 27 interchange to access I-26.

Based on the conversation during the meeting, the site is anticipated to have one large tenant, expected to draw 70,000 trucks annually from port(s) in Charleston (leading to 70,000 return trips as well), and expected to generate 50,000 exiting trucks annually traveling westbound (leading to 50,000 return trips as well). In addition to this large tenant, smaller tenants on the site are expected. It was estimated that roughly 7 smaller tenants may fill out the site, drawing approximately 3,500 trucks from Charleston (and 3,500 trucks back to Charleston) and generating 3,500 trucks westbound (and 3,500 return truck trips). The projections are also shown (by entering and existing direction) in Table 14.

These estimates lead to approximately 338,000 annual truck trips: 169,000 entering ($70,000 + 50,000 + 3,500 \times 14$) and 169,000 exiting ($70,000 + 50,000 + 3,500 \times 14$).

The first assumption concerning ingress and egress truck traffic assumed 24 hour/day and 7 day/week operation, and assuming trips are evenly distributing throughout the week and day of the week, these 338,000 annual truck trips translate to approximately 940 daily truck trips (470 entering and 470 exiting) and approximately 40 hourly truck trips (20 entering and 20 exiting), as shown in Table 14 as well.

Feedback from the SCSPA noted that peak hour truck traffic would likely be 25% higher than the 20 entering/exiting assumed. Therefore, 25 entering and 25 exiting trucks in both AM and PM peak hours was assumed in the traffic analysis.



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Table 14 – Ridgeville Industrial Site Annual Trip Projections

Assume 24-hour/day, 7 days/week operation (evenly distributed)				
Assumed 7 Additional Smaller Tenants	3,500		3,500	
	3,500		3,500	
	3,500		3,500	
	3,500		3,500	Assumed 7 Additional Smaller Tenants
	3,500		3,500	
	3,500		3,500	
	3,500		3,500	
Large Tenant	50,000		70,000	Large Tenant
74,500			94,500	
COLA, I-95, etc.	←	SITE	←	CHS
	→		→	
Assumed 7 Additional Smaller Tenants	50,000		70,000	Large Tenant
	3,500		3,500	
	3,500		3,500	
	3,500		3,500	
	3,500		3,500	Assumed 7 Additional Smaller Tenants
	3,500		3,500	
	3,500		3,500	
	3,500		3,500	
	3,500		3,500	
74,500			94,500	
NUMBER OF TRIPS				
		Entering	Exiting	TOTAL
Rounded up to nearest 10	Annually	169,000	169,000	338,000
	Daily	470	470	940
	Hourly	20	20	40

5.6 BALANCE TRAFFIC VOLUMES

With existing counts adjusted, background growth applied, and development traffic added, the final step was balancing 2023 opening year and 2043 horizon year volumes along the interstate as well as along the cross-streets. With this final step completed, all existing and future traffic volumes were complete and prepared for capacity analysis. Table 15 lists the traffic volume exhibits within Appendix A, corresponding to the scenario traffic volumes as well as intermediate traffic volume development steps.

Balanced 2018, 2023, and 2043 peak hour traffic volumes (used in the capacity analysis discussed in section 6.0 – Capacity Analysis, are shown in Figure 27, Figure 28, and Figure 29.



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Table 15 – Traffic Volume Exhibits (in Appendix A)

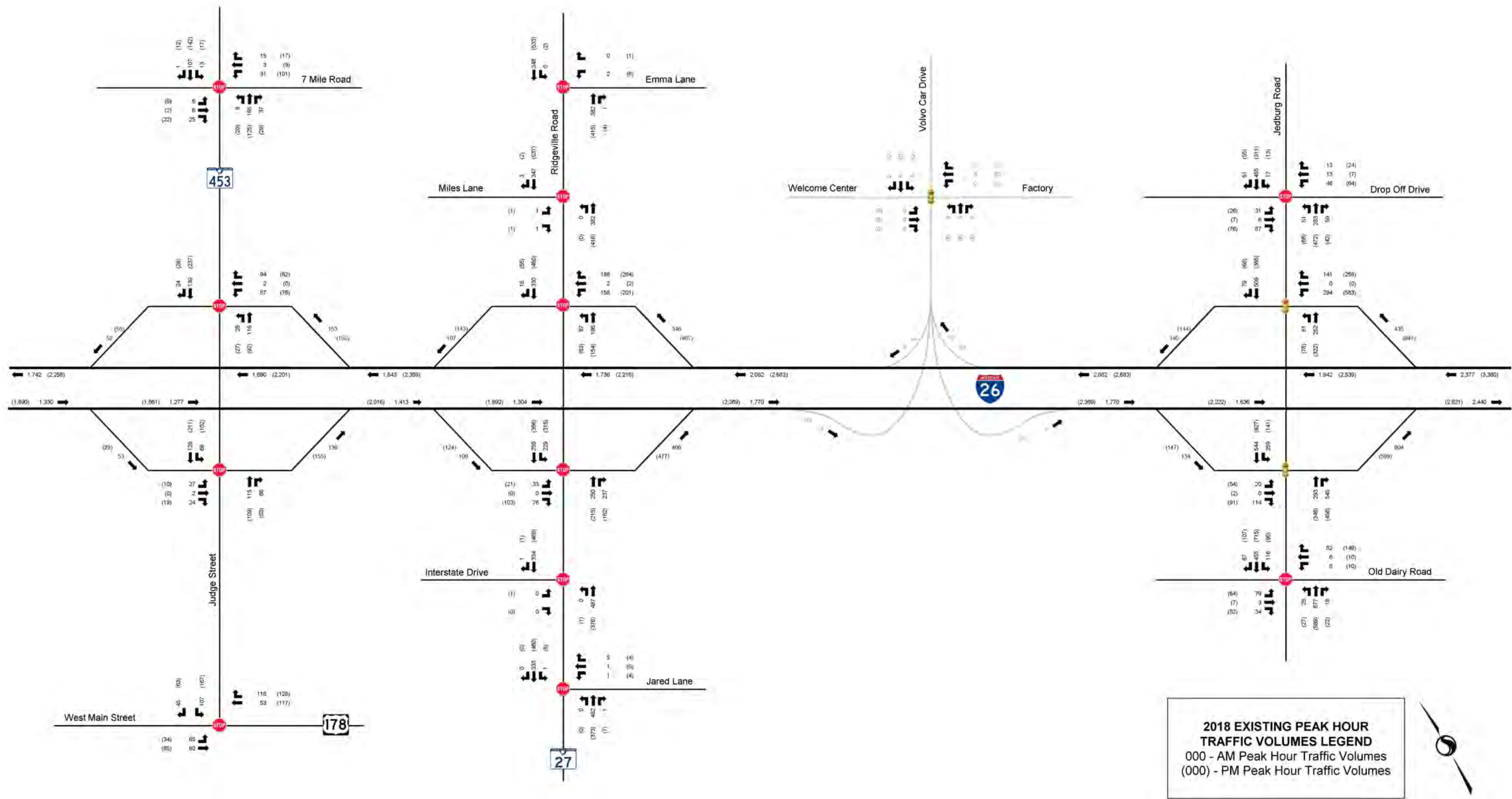
Appendix Exhibit	Description
A.1 Intersection Traffic Volume Development Worksheets	Shows the intersection development for each movement at each intersection
A.2 2018 Unbalanced	Shows the raw volumes as counted in the data collection process
A.3 2018 Balance Adjustments	Shows adjustments made to each volume in order to balance in the network
A.4 2018 Balanced	Shows the raw volumes +/- the balance adjustments from the previous figure – these represent the 2018 Existing Volumes to be used in analysis, and from which the 2023 and 2043 volumes were developed with background growth and Volvo/Camp Hall related traffic
A.5 2023 Background Growth	Shows the background growth between 2018 and 2023 according to the growth rates for the mainline segments and cross-streets as stated above
A.6 2023 Volvo Traffic	Shows the Volvo/Camp Hall related traffic at the ramps and at the intersection north the interstate (anticipated by the Volvo Car Drive IJR in 2019 and grown to 2023 using the recommended growth rate from said IJR – note that the volumes are not carried along to the mainline, because the growth rates for the mainline were calculated using the CHATS and SCSWM projections, which include Volvo/Camp Hall related growth.
A.7 2023 Unbalanced	These volumes represent the 2018 Existing Volumes + 2023 background growth + 2023 Volvo/Camp Hall related traffic, but unbalanced throughout the network
A.8 2023 Balance Adjustments	Shows adjustments made to each volume in order to balance in the network
A.9 2023 Balanced	Shows the 2023 unbalanced volumes +/- the balance adjustments – these represent the 2023 Opening Year Volumes to be used in analysis.
A.10 2043 Background Growth	Shows the background growth between 2018 and 2043 according to the growth rates for the mainline segments and cross-streets as stated above
A.11 2043 Volvo Traffic	Shows the Volvo/Camp Hall related traffic at the ramps and at the intersection north the interstate (anticipated by the Volvo Car Drive IJR in 2039 and grown to 2043 using the recommended growth rate from said IJR – note that the volumes are not carried along to the mainline, because the growth rates for the mainline were calculated using the CHATS and SCSWM projections, which include Volvo/Camp Hall related growth.
A.12 2043 Unbalanced	These volumes represent the 2018 Existing Volumes + 2043 background growth + 2043 Volvo/Camp Hall related traffic, but unbalanced throughout the network
A.13 2043 Balance Adjustments	Shows adjustments made to each volume in order to balance in the network
A.14 2043 Balanced	Shows the 2043 unbalanced volumes +/- the balance adjustments – these represent the 2043 Design Year Volumes to be used in analysis.
A.15 Volvo Traffic Schedules	2019 and 2039 Volvo Traffic Schedules



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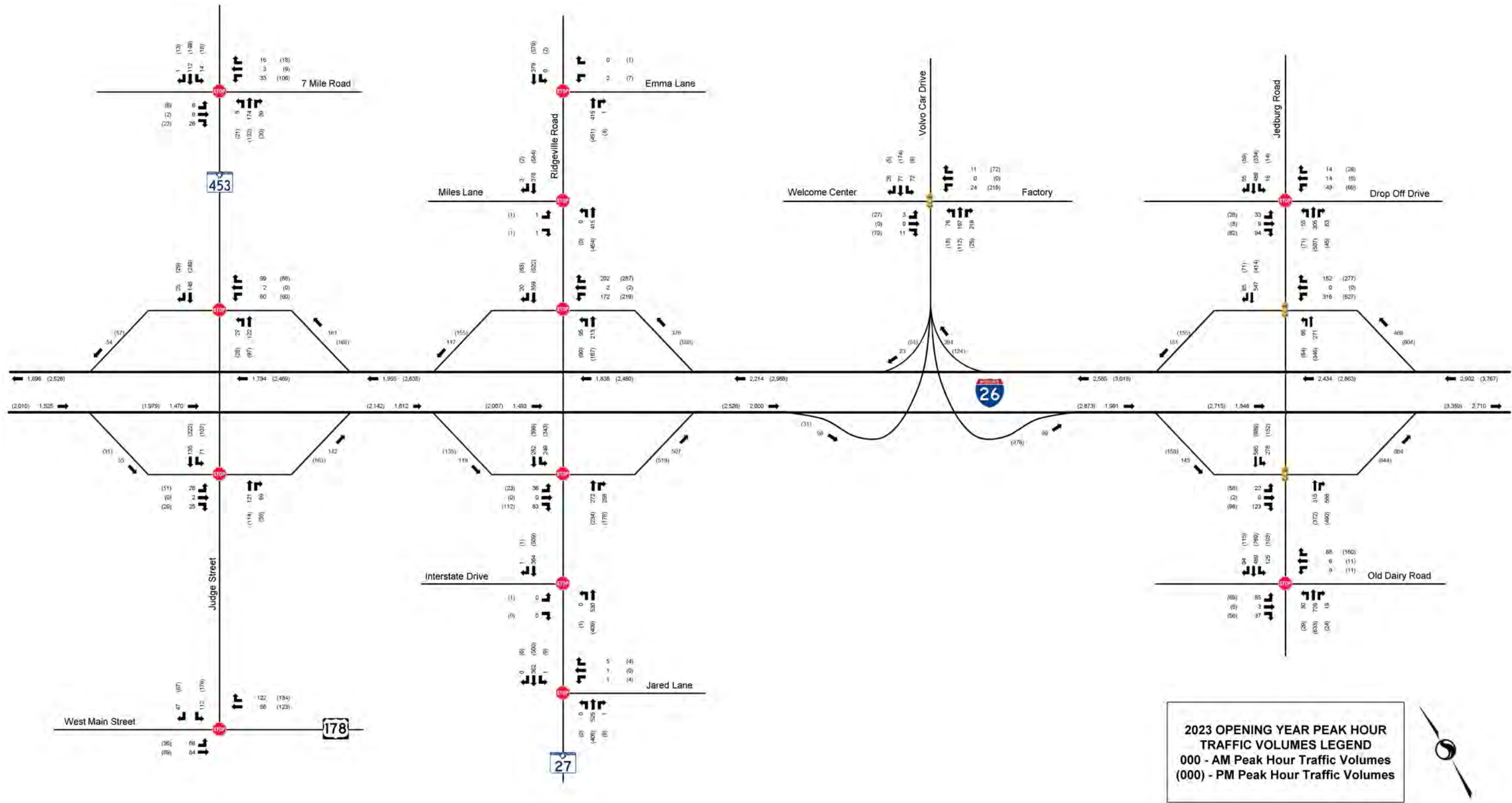
Figure 27 – 2018 Existing Peak Hour Design Volumes



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Traffic Volume Forecasting
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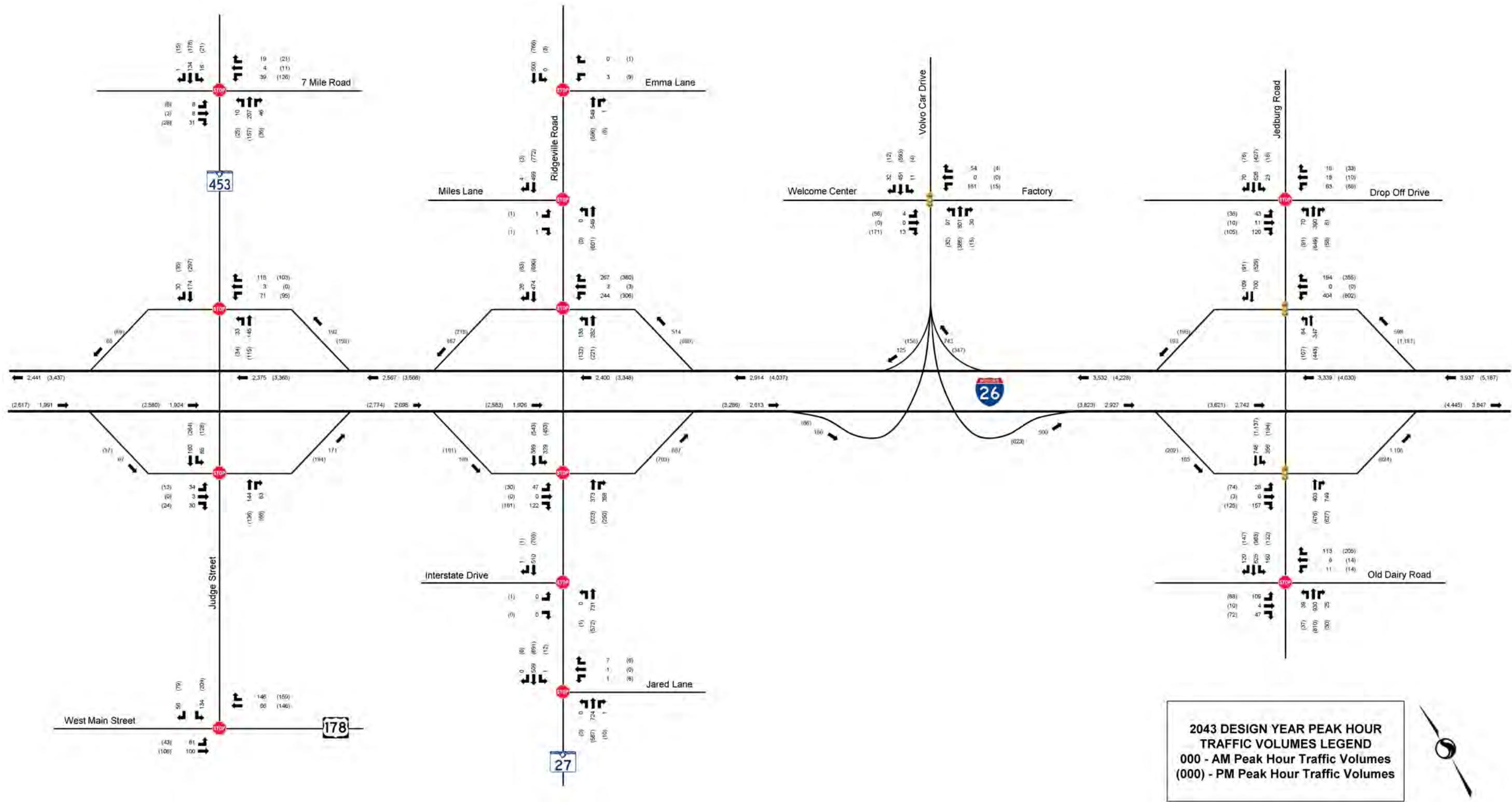
Figure 28 – 2023 Opening Year Peak Hour Design Volumes



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Figure 29 – 2043 Design Year Peak Hour Design Volumes



6.0 CAPACITY ANALYSIS

A series of capacity analyses were performed based on the methodologies and guidelines contained in the Transportation Research Board's publication *HCM 2010 Highway Capacity Manual* (HCM, 2010). Software analysis and simulation packages based on the HCM were used in performing the analyses:

McTrans HCS 2010

- Freeway Segments
- Ramp Merge/Diverge Areas

Trafficware's Synchro (Version 9)

- Unsignalized Intersections
- Signalized Intersections

The analysis methodologies contained in the HCM for the various facility types and users describe the operational conditions in terms of a Level of Service (LOS). The HCM defines LOS as:

"...a quality measure describing operations conditions within a traffic stream, generally in terms of such service measures as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience. Six LOS are defined for each type of facility that has analysis procedures available. Letters designate each level, from A to F, with LOS A representing the best operating conditions and LOS F the worst. Each level of service represents a range of operating conditions and the driver's perception of those conditions. Safety is not included in the measures that establish service levels."

The following discussions and tables describe the HCM LOS criteria for basic freeway segments, freeway ramp merges/diverges, unsignalized intersections, signalized intersections, and class III two-lane highways.

The HCM characterizes the capacity of a basic freeway segment "...by three performance measures: density in passenger cars per mile per lane (pc/mi/ln), space mean speed in miles per hour (mi/h), and the ratio of demand flow rate to capacity (v/c). Each of these measures is an indication of how well traffic is being accommodated by the basic freeway segment." LOS F occurs when either the segment density exceeds 45 pc/mi/ln or when the v/c ratio exceeds 1.0 (regardless of the segment density). Table 16 shows the HCM LOS criteria for freeway segments.

Ramp-freeway junctions occur when merging maneuvers occur (on-ramps) or when diverging maneuvers occur (off-ramps). The operation of these merge and diverge areas are affected by several factors, including the operation of the adjacent freeway segment and the proximity and flow on adjacent ramps. Typically, the influence area of ramps is 1,500 feet upstream of a diverge point and downstream of a merge point. As with freeway segments and weaving segments, the LOS of a merge or diverge area is related to the density of the segment. Regardless of the density, the merge or diverge areas are considered to operate at LOS F when the freeway demand exceeds the capacity of the upstream freeway segment at diverge areas or the downstream freeway segment at merge areas, as well as when the ramp demand exceeds the ramp capacity. Table 16 shows the HCM LOS criteria for ramp merge and diverge areas.



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Table 16 – Freeway LOS Criteria

Density (pc/mi/ln)		
LOS	Basic Freeway Segments	Merge/Diverge Areas
A	< 11	< 10
B	> 11-18	> 10-20
C	> 18-26	> 20-28
D	> 26-35	> 28-35
E	> 35-45	> 35
F	> 45 v/c > 1.0	v/c > 1.0

The LOS for unsignalized intersections is based on the average control delay per vehicle. Since major street traffic is seldom controlled by stop signs (except at intersections with all-way stop control or in special circumstances), major street traffic generally will experience virtually no delay. Most of the delay will be encountered by traffic on approaches controlled by stop signs. Under certain conditions, delay will also be encountered by left turning traffic on the major street waiting for appropriate gaps in the opposing traffic flow to complete their turn. Therefore, the delay experienced by stop controlled movements and major street left turns, rather than the entire average intersection delay, are used to identify the critical LOS at these intersections. Table 17 shows the HCM LOS criteria for unsignalized intersections.

The LOS for signalized intersections is based on the average control delay per vehicle. LOS can be identified for the entire intersection, individual approaches, and each movement/lane-group. Table 17 shows the HCM LOS criteria for signalized intersections.

Table 17 – Intersection LOS Criteria

Control Delay (sec/veh)		
LOS	Unsignalized Intersections	Signalized Intersections
A	< 10	< 10
B	> 10-15	> 10-20
C	> 15-25	> 20-35
D	> 25-35	> 35-55
E	> 35-50	> 55-80
F	> 50	> 80



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The HCM describes Class III two-lane highways as those serving moderately developed areas. They may be portions of a Class I or Class II highway that pass through small towns or developed recreational areas. On such segments, local traffic often mixes with through traffic, and the density of unsignalized roadside access points is noticeably higher than in a purely rural area. The LOS of a Class III two-lane highway is based upon percent free flow speed (PFFS). Table 18 shows the LOS criteria for Class III two-lane highways.

Table 18 – Class III Two-Lane Highway LOS Criteria

Class III Two-Lane Highways	
LOS	Percent Free-Flow Speed (PFFS)
A	> 91.7%
B	> 83.3% – 91.7%
C	> 75.0% – 83.3%
D	> 66.7% – 75.0%
E	< 66.7%
F	---

The analysis of basic freeway segments, merge/diverge areas, intersection, and two-lane highway levels of service within the study area were performed for Existing Conditions (2018), future Opening Year (2023) No-Build and Build Conditions and future Design Year (2043) No-Build and Build Conditions. The traffic volumes pertaining to each analysis scenarios can be found in Figure 27, Figure 28, and Figure 29. The following criteria were identified in the capacity analysis:

- Future 2023 and 2043 volumes as discussed in the previous section were used;
- Peak hour factors were determined according to existing mainline and intersection counts – future year condition peak hour factors were kept between the limits of 0.90 and 0.95;
- The proportion of trucks and buses traveling on the freeway segments, ramp movements, and adjacent roadways were determined according to existing counts as well as future expected heavy vehicle traffic; and
- Based on the grades through the study area, the terrain was selected as “Level”.

The following sections detail the intersection, freeway segment, merge area, and diverge area Existing (2018), Opening Year (2023) and Design Year (2043) levels of service for the study area, including the mainline I-26 corridor, the project interchange, and the three adjacent interchanges in the study area. Each section calls out specific areas which experience or are projected to experience undesirable levels of service – being defined as having a level of service of E or F.

For signalized intersections, the total intersection average delay is reported. For stop-controlled intersections, the delay (and resulting LOS) of the worst approach is reported.



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6.1 2018 EXISTING CONDITIONS

Table 19 shows the resulting LOS for 2018 Existing Conditions throughout the study area. Interstate sections are listed first, beginning with eastbound sections first (starting west of SC 453 and proceeding eastward), followed by westbound sections (starting east of Jedburg Road and proceeding westward). Basic freeway segments are designated by “FS”, Diverges by “D”, and Merges by “M”. Two-lane highway sections are listed next, followed by intersections. For intersections, two-way-stop-controlled intersections are designated by “TWSC” and signalized intersections by “SIGNAL”. The inputs used to obtain these results are provided in Appendix B.1, along with diagrams showing the locations of the analysis items. The HCS results sheets are provided in Appendix C.1 and the intersection results sheets are provided in Appendix D.1.

Table 19 – 2018 Existing Condition LOS Analysis Results

Analysis Item			AM		PM	
			LOS	Density/ PFFS/ Delay	LOS	Density/ PFFS/ Delay
No.	Type	Description				
Interstate Section (Density – pc/mi/ln)						
FSEB1	FS	I-26 EB West of SC 453	B	11.7	B	15.4
DEB1	D	I-26 EB SC 453 Off-Ramp	B	14.1	B	18.6
FSEB2	FS	I-26 EB at SC 453	A	10.5	B	14.2
MEB1	M	I-26 EB SC 453 On-Ramp	B	14.2	B	18.6
FSEB3	FS	I-26 EB Between SC 453 and SC 27	B	11.6	B	15.4
DEB2	D	I-26 EB SC 27 Off-Ramp	B	15.2	B	20.0
FSEB4	FS	I-26 EB at SC 27	A	10.7	B	14.4
MEB2	M	I-26 EB SC 27 On-Ramp	B	17.1	C	21.9
FSEB5	FS	I-26 EB Between SC 27 and Volvo	B	14.5	C	18.4
DEB3	D	I-26 EB Volvo Off-Ramp	---	---	---	---
FSEB6	FS	I-26 EB at Volvo	B	14.5	C	18.4
MEB3	M	I-26 EB Volvo On-Ramp	---	---	---	---
FSEB7	FS	I-26 EB Between Volvo & Jedburg	B	14.5	C	18.4
DEB4	D	I-26 EB Jedburg Off-Ramp	B	18.5	C	23.0
FSEB8	FS	I-26 EB at Jedburg	B	13.4	B	17.1
MEB4	M	I-26 EB Jedburg On-Ramp	C	21.4	C	23.7
FSEB9	FS	I-26 EB East of Jedburg	C	21.8	C	23.7
FSWB1	FS	I-26 WB East of Jedburg	C	20.7	D	30.8
DWB1	D	I-26 WB Jedburg Off-Ramp	C	24.7	D	33.7
FSWB2	FS	I-26 WB At Jedburg	B	15.7	C	20.2



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Table 19 – 2018 Existing Condition LOS Analysis Results (cont.)

Analysis Item			AM		PM	
			LOS	Density/ PFFS/ Delay	LOS	Density/ PFFS/ Delay
No.	Type	Description				
DWB1.1	---	I-26 WB Jedburg Loop Off-Ramp	---	---	---	---
FSWB2.1	---	I-26 WB west of Loop Off-Ramp	---	---	---	---
MWB1	M	I-26 WB Jedburg On-Ramp	C	20.1	C	24.6
FSWB3	FS	I-26 WB Between Jedburg and Volvo	B	16.9	C	21.7
DWB2	D	I-26 WB Volvo Off-Ramp	---	---	---	---
FSWB4	FS	I-26 WB At Volvo	B	16.9	C	21.7
MWB2	M	I-26 WB Volvo On-Ramp	---	---	---	---
FSWB5	FS	I-26 WB Between Volvo and SC 27	B	16.9	C	21.7
DWB3	D	I-26 WB SC 27 Off-Ramp	C	21.4	C	26.4
FSWB6	FS	I-26 WB at SC 27	B	14.0	B	17.3
MWB3	M	I-26 WB SC 27 On-Ramp	B	17.2	C	21.3
FSWB7	FS	I-26 WB Between SC 27 and SC 453	B	14.9	C	18.5
DWB4	D	I-26 WB SC 453 Off-Ramp	B	19.1	C	23.4
FSWB8	FS	I-26 WB at SC 453	B	13.6	B	17.1
MWB4	M	I-26 WB SC 453 On-Ramp	B	16.9	C	21.4
FSWB9	FS	I-26 WB West of SC 453	B	15.0	C	18.7
Two-Lane Highway Section (Percent Free-Flow Speed – %)						
TLNB1	III	Jedburg Road North of I-26 (NB)	C	78.9%	C	76.7%
TLSB1	III	Jedburg Road North of I-26 (SB)	C	76.6%	C	78.2%
TLNB2	III	Jedburg Road South of I-26 (NB)	D	73.0%	D	70.6%
TLSB2	III	Jedburg Road South of I-26 (SB)	D	74.5%	D	69.9%
TLNB3	III	Volvo Car Drive (NB)	---	---	---	---
TLSB3	III	Volvo Car Drive (SB)	---	---	---	---
TLNB4	III	SC 27 North of I-26 (NB)	C	78.9%	D	74.6%
TLSB4	III	SC 27 North of I-26 (SB)	C	79.3%	D	73.4%
TLNB5	III	SC 27 South of I-26 (NB)	C	79.7%	C	79.8%
TLSB5	III	SC 27 South of I-26 (SB)	C	81.1%	C	79.0%
TLNB6	III	SC 453 North of I-26 (NB)	B	83.9%	C	83.0%
TLSB6	III	SC 453 North of I-26 (SB)	B	83.3%	C	80.1%
TLNB7	III	SC 453 South of I-26 (NB)	C	81.2%	C	81.5%
TLSB7	III	SC 453 South of I-26 (SB)	C	81.7%	C	80.3%



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Table 19 – 2018 Existing Condition LOS Analysis Results (cont.)

Analysis Item			AM		PM	
			LOS	Density/ PFFS/ Delay	LOS	Density/ PFFS/ Delay
No.	Type	Description				
Intersection (Delay – sec/veh)						
1	TWSC	Jedburg Road & Old Dairy Road	F	> 300 (EB)	F	> 300 (EB)
2	SIGNAL	Jedburg Road & I-26 EB Ramps	B	12.6	A	9.3
3	SIGNAL	Jedburg Road & I-26 WB Ramps	C	20.4	C	27.3
4	TWSC	Jedburg Road & Drop Off Drive	D	33.4 (WB)	E	38.3 (WB)
5	TWSC	SC 27 & Emma Lane	C	15.4 (WB)	C	23.2 (WB)
6	TWSC	SC 27 & Miles Lane	B	14.3 (EB)	C	21.4 (EB)
7	TWSC	SC 27 & I-26 WB Ramps	E	37.0 (WB)	F	233.5 (WB)
8	TWSC	SC 27 & I-26 EB Ramps	C	24.8 (EB)	D	32.0 (EB)
9	TWSC	SC 27 & Interstate Drive	A	0.0 (EB)	C	16.7 (EB)
10	TWSC	SC 27 & Jared Lane	B	13.2 (WB)	B	13.9 (WB)
11	TWSC	SC 453 & 7 Mile Road	B	12.1 (WB)	B	14.0 (WB)
12	TWSC	SC 453 & I-26 WB Ramps	B	11.7 (WB)	B	12.3 (WB)
13	TWSC	SC 453 & I-26 EB Ramps	B	12.3 (EB)	B	12.7 (EB)
14	TWSC	SC 453 & US 178	B	13.1 (SB)	C	16.0 (SB)
15	SIGNAL	Volvo Car Drive & Factory Entrance	---	---	---	---

The results of the 2018 Existing Condition analysis indicate that the interstate mainline, and all merge/diverge areas operate at an acceptable level of service. However, several intersections currently operate at undesirable levels of service, including:

- Jedburg Road & Drop-Off Drive (PM peak hour);
- Jedburg Road & Old Dairy Road (AM and PM peak hours); and
- SC 27 & I-26 WB Ramps (AM and PM peak hours).



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6.2 2023 NO BUILD CONDITIONS

Table 20 shows the resulting LOS for 2023 No Build Conditions throughout the study area. The inputs used to obtain these results are provided in Appendix B.2, along with diagrams showing the locations of the analysis items. The HCS results sheets are provided in Appendix C.2 and the intersection results sheets are provided in Appendix D.2.

Table 20 – 2023 No Build Condition LOS Analysis Results

Analysis Item			AM		PM	
			LOS	Density/ PFFS/ Delay	LOS	Density/ PFFS/ Delay
No.	Type	Description				
Interstate Section (Density – pc/mi/ln)						
FSEB1	FS	I-26 EB West of SC 453	B	13.4	B	16.4
DEB1	D	I-26 EB SC 453 Off-Ramp	B	16.2	B	19.8
FSEB2	FS	I-26 EB at SC 453	B	12.1	B	15.1
MEB1	M	I-26 EB SC 453 On-Ramp	B	15.9	B	19.6
FSEB3	FS	I-26 EB Between SC 453 and SC 27	B	13.2	B	16.4
DEB2	D	I-26 EB SC 27 Off-Ramp	B	17.3	C	21.2
FSEB4	FS	I-26 EB at SC 27	B	12.3	B	15.3
MEB2	M	I-26 EB SC 27 On-Ramp	B	19.3	C	22.7
FSEB5	FS	I-26 EB Between SC 27 and Volvo	B	16.5	C	19.8
DEB3	D	I-26 EB Volvo Off-Ramp	B	14.6	B	18.2
FSEB6	FS	I-26 EB at Volvo	B	15.7	C	19.5
MEB3	M	I-26 EB Volvo On-Ramp	A	0.0	A	2.6
FSEB7	FS	I-26 EB Between Volvo & Jedburg	B	16.5	C	23.3
DEB4	D	I-26 EB Jedburg Off-Ramp	B	17.7	C	22.0
FSEB8	FS	I-26 EB at Jedburg	A	10.1	B	13.8
MEB4	M	I-26 EB Jedburg On-Ramp	B	16.7	B	18.6
FSEB9	FS	I-26 EB East of Jedburg	B	15.9	C	18.3
FSWB1	FS	I-26 WB East of Jedburg	B	16.7	C	20.9
DWB1	D	I-26 WB Jedburg Off-Ramp	C	23.4	C	27.7
FSWB2	FS	I-26 WB At Jedburg	B	14.8	C	18.3
DWB1.1	---	I-26 WB Jedburg Loop Off-Ramp	B	16.5	C	20.6
FSWB2.1	---	I-26 WB west of Loop Off-Ramp	B	13.1	B	14.7
MWB1	M	I-26 WB Jedburg On-Ramp	B	11.5	B	13.2
FSWB3	FS	I-26 WB Between Jedburg and Volvo	C	21.8	C	25.3
DWB2	D	I-26 WB Volvo Off-Ramp	A	0.0	A	0.0



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Table 20 – 2023 No Build Condition LOS Analysis Results (cont.)

Analysis Item			AM		PM	
			LOS	Density/ PFFS/ Delay	LOS	Density/ PFFS/ Delay
No.	Type	Description				
FSWB4	FS	I-26 WB At Volvo	B	17.9	C	23.9
MWB2	M	I-26 WB Volvo On-Ramp	B	16.9	C	22.9
FSWB5	FS	I-26 WB Between Volvo and SC 27	C	18.1	C	25.0
DWB3	D	I-26 WB SC 27 Off-Ramp	C	22.7	D	29.5
FSWB6	FS	I-26 WB at SC 27	B	14.8	C	19.7
MWB3	M	I-26 WB SC 27 On-Ramp	B	18.2	C	23.5
FSWB7	FS	I-26 WB Between SC 27 and SC 453	B	15.8	C	21.2
DWB4	D	I-26 WB SC 453 Off-Ramp	C	20.3	C	26.2
FSWB8	FS	I-26 WB at SC 453	B	14.4	C	19.6
MWB4	M	I-26 WB SC 453 On-Ramp	B	17.8	C	23.2
FSWB9	FS	I-26 WB West of SC 453	B	16.4	C	21.1
Two-Lane Highway Section (Percent Free-Flow Speed – %)						
TLNB1	III	Jedburg Road North of I-26 (NB)	C	78.1%	C	75.8%
TLSB1	III	Jedburg Road North of I-26 (SB)	C	75.8%	C	77.4%
TLNB2	III	Jedburg Road South of I-26 (NB)	D	71.6%	D	68.8%
TLSB2	III	Jedburg Road South of I-26 (SB)	D	73.1%	D	68.3%
TLNB3	III	Volvo Car Drive (NB)	B	88.1%	B	87.2%
TLSB3	III	Volvo Car Drive (SB)	B	87.7%	B	86.8%
TLNB4	III	SC 27 North of I-26 (NB)	C	78.0%	C	75.4%
TLSB4	III	SC 27 North of I-26 (SB)	C	78.4%	D	74.1%
TLNB5	III	SC 27 South of I-26 (NB)	C	78.9%	C	79.7%
TLSB5	III	SC 27 South of I-26 (SB)	C	80.3%	C	78.9%
TLNB6	III	SC 453 North of I-26 (NB)	B	83.4%	C	82.8%
TLSB6	III	SC 453 North of I-26 (SB)	C	83.2%	C	82.5%
TLNB7	III	SC 453 South of I-26 (NB)	C	81.1%	C	81.5%
TLSB7	III	SC 453 South of I-26 (SB)	C	81.6%	C	80.1%
Intersection (Delay – sec/veh)						
1	TWSC	Jedburg Road & Old Dairy Road	F	280.6 (EB)	F	> 300 (EB)
2	SIGNAL	Jedburg Road & I-26 EB Ramps	B	13.1	A	8.8
3	SIGNAL	Jedburg Road & I-26 WB Ramps	A	2.6	A	2.6
4	TWSC	Jedburg Road & Drop Off Drive	D	25.0 (WB)	D	31.4 (WB)



I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

Capacity Analysis

June 2019

Table 20 – 2023 No Build Condition LOS Analysis Results (cont.)

Analysis Item			AM		PM	
No.	Type	Description	LOS	Density/ PFFS/ Delay	LOS	Density/ PFFS/ Delay
5	TWSC	SC 27 & Emma Lane	C	16.5 (WB)	C	20.9 (WB)
6	TWSC	SC 27 & Miles Lane	C	15.1 (EB)	C	20.0 (EB)
7	TWSC	SC 27 & I-26 WB Ramps	F	61.6 (WB)	F	237.0 (WB)
8	TWSC	SC 27 & I-26 EB Ramps	D	33.1 (EB)	E	40.4 (EB)
9	TWSC	SC 27 & Interstate Drive	A	0.0 (EB)	C	18.0 (EB)
10	TWSC	SC 27 & Jared Lane	B	13.8 (WB)	B	14.8 (WB)
11	TWSC	SC 453 & 7 Mile Road	B	12.3 (WB)	B	14.5 (WB)
12	TWSC	SC 453 & I-26 WB Ramps	B	12.0 (WB)	B	12.6 (WB)
13	TWSC	SC 453 & I-26 EB Ramps	B	12.5 (EB)	B	12.8 (EB)
14	TWSC	SC 453 & US 178	B	13.5 (SB)	C	15.8 (SB)
15	SIGNAL	Volvo Car Drive & Factory Entrance	B	12.6	B	16.4

The 2023 Opening Year No Build Conditions analysis indicates that the interstate mainline and merge/diverge areas are expected to continue to operate at an acceptable level of service. However, similar to the existing conditions, several intersections are anticipated to operate at undesirable levels of service, including:

- Jedburg Road & Old Dairy Road (AM and PM peak hours);
- SC 27 & I-26 EB Ramps (PM Peak hour); and
- SC 27 & I-26 WB Ramps (AM and PM peak hours).



I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

Capacity Analysis

June 2019

6.3 2043 NO BUILD CONDITIONS

Table 21 shows the resulting LOS for 2043 No Build Conditions throughout the study area. The inputs used to obtain these results are provided in Appendix B.3, along with diagrams showing the locations of the analysis items. The HCS results sheets are provided in Appendix C.3 and the Intersection results sheets are provided in Appendix D.3.

Table 21 – 2043 No Build Condition LOS Analysis Results

Analysis Item			AM		PM	
			LOS	Density/ PFFS/ Delay	LOS	Density/ PFFS/ Delay
No.	Type	Description				
Interstate Section (Density – pc/mi/ln)						
FSEB1	FS	I-26 EB West of SC 453	B	17.5	C	21.6
DEB1	D	I-26 EB SC 453 Off-Ramp	C	21.1	C	25.8
FSEB2	FS	I-26 EB at SC 453	B	15.9	C	20.3
MEB1	M	I-26 EB SC 453 On-Ramp	C	20.6	C	25.2
FSEB3	FS	I-26 EB Between SC 453 and SC 27	B	17.4	C	22.2
DEB2	D	I-26 EB SC 27 Off-Ramp	C	22.4	C	27.4
FSEB4	FS	I-26 EB at SC 27	B	15.9	C	20.3
MEB2	M	I-26 EB SC 27 On-Ramp	C	25.1	D	29.4
FSEB5	FS	I-26 EB Between SC 27 and Volvo	C	22.7	D	28.2
DEB3	D	I-26 EB Volvo Off-Ramp	C	21.1	C	25.7
FSEB6	FS	I-26 EB at Volvo	C	20.7	D	27.1
MEB3	M	I-26 EB Volvo On-Ramp	A	4.7	B	11.0
FSEB7	FS	I-26 EB Between Volvo & Jedburg	D	26.5	E	36.7
DEB4	D	I-26 EB Jedburg Off-Ramp	C	23.7	C	27.4
FSEB8	FS	I-26 EB at Jedburg	B	15.0	C	18.8
MEB4	M	I-26 EB Jedburg On-Ramp	C	24.0	C	25.0
FSEB9	FS	I-26 EB East of Jedburg	C	23.1	C	25.2
FSWB1	FS	I-26 WB East of Jedburg	C	23.2	D	31.9
DWB1	D	I-26 WB Jedburg Off-Ramp	D	29.4	E	35.5
FSWB2	FS	I-26 WB At Jedburg	C	20.9	D	27.9
DWB1.1	---	I-26 WB Jedburg Loop Off-Ramp	C	22.4	C	27.6
FSWB2.1	---	I-26 WB west of Loop Off-Ramp	C	18.2	C	21.7
MWB1	M	I-26 WB Jedburg On-Ramp	B	16.7	B	19.4
FSWB3	FS	I-26 WB Between Jedburg and Volvo	E	35.0	F	47.1
DWB2	D	I-26 WB Volvo Off-Ramp	A	0.4	F	V/C > 1



I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

Capacity Analysis

June 2019

Table 21 – 2043 No Build Condition LOS Analysis Results (cont.)

Analysis Item			AM		PM	
			LOS	Density/ PFFS/ Delay	LOS	Density/ PFFS/ Delay
No.	Type	Description				
FSWB4	FS	I-26 WB At Volvo	C	24.1	E	38.7
MWB2	M	I-26 WB Volvo On-Ramp	C	23.4	D	32.4
FSWB5	FS	I-26 WB Between Volvo and SC 27	C	25.6	E	42.2
DWB3	D	I-26 WB SC 27 Off-Ramp	D	30.0	E	39.9
FSWB6	FS	I-26 WB at SC 27	C	19.9	D	29.6
MWB3	M	I-26 WB SC 27 On-Ramp	C	24.0	D	31.9
FSWB7	FS	I-26 WB Between SC 27 and SC 453	C	21.6	D	33.0
DWB4	D	I-26 WB SC 453 Off-Ramp	C	26.6	E	35.3
FSWB8	FS	I-26 WB at SC 453	C	19.7	D	29.9
MWB4	M	I-26 WB SC 453 On-Ramp	C	23.4	D	31.5
FSWB9	FS	I-26 WB West of SC 453	C	21.3	D	31.6
Two-Lane Highway Section (Percent Free-Flow Speed – %)						
TLNB1	III	Jedburg Road North of I-26 (NB)	D	74.3%	D	71.9%
TLSB1	III	Jedburg Road North of I-26 (SB)	D	72.0%	D	73.5%
TLNB2	III	Jedburg Road South of I-26 (NB)	E	65.8%	E	60.9%
TLSB2	III	Jedburg Road South of I-26 (SB)	E	66.7%	E	60.8%
TLNB3	III	Volvo Car Drive (NB)	D	71.7%	C	77.7%
TLSB3	III	Volvo Car Drive (SB)	D	71.8%	C	76.7%
TLNB4	III	SC 27 North of I-26 (NB)	D	74.7%	D	70.0%
TLSB4	III	SC 27 North of I-26 (SB)	C	75.1%	D	69.0%
TLNB5	III	SC 27 South of I-26 (NB)	D	74.2%	D	74.9%
TLSB5	III	SC 27 South of I-26 (SB)	C	75.7%	D	74.0%
TLNB6	III	SC 453 North of I-26 (NB)	C	81.1%	C	82.0%
TLSB6	III	SC 453 North of I-26 (SB)	C	82.5%	C	81.5%
TLNB7	III	SC 453 South of I-26 (NB)	C	80.1%	C	80.4%
TLSB7	III	SC 453 South of I-26 (SB)	C	80.7%	C	78.8%
Intersection (Delay – sec/veh)						
1	TWSC	Jedburg Road & Old Dairy Road	F	> 300 (EB)	F	> 300 (EB)
2	SIGNAL	Jedburg Road & I-26 EB Ramps	C	34.1	B	11.2
3	SIGNAL	Jedburg Road & I-26 WB Ramps	A	2.5	A	2.6
4	TWSC	Jedburg Road & Drop Off Drive	F	52.0 (WB)	F	109.4 (WB)



I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

Capacity Analysis

June 2019

Table 21 – 2043 No Build Condition LOS Analysis Results (cont.)

Analysis Item			AM		PM	
			LOS	Density/ PFFS/ Delay	LOS	Density/ PFFS/ Delay
No.	Type	Description				
5	TWSC	SC 27 & Emma Lane	C	22.1 (WB)	D	33.1 (WB)
6	TWSC	SC 27 & Miles Lane	C	19.3 (EB)	D	29.5 (EB)
7	TWSC	SC 27 & I-26 WB Ramps	F	> 300 (WB)	F	> 300 (WB)
8	TWSC	SC 27 & I-26 EB Ramps	F	> 300 (EB)	F	> 300 (EB)
9	TWSC	SC 27 & Interstate Drive	A	0.0 (EB)	D	27.1 (EB)
10	TWSC	SC 27 & Jared Lane	C	17.5 (WB)	C	21.0 (WB)
11	TWSC	SC 453 & 7 Mile Road	B	13.5 (WB)	C	17.6 (WB)
12	TWSC	SC 453 & I-26 WB Ramps	B	13.2 (WB)	B	14.5 (WB)
13	TWSC	SC 453 & I-26 EB Ramps	B	13.8 (EB)	B	14.3 (EB)
14	TWSC	SC 453 & US 178	C	15.7 (SB)	C	20.6 (SB)
15	SIGNAL	Volvo Car Drive & Factory Entrance	C	22.0	C	21.8

The 2043 Design Year No Build Conditions analysis indicates that several freeway segments and diverge locations along the interstate are anticipated to operate at undesirable levels of service, including:

- I-26 WB Diverge to Jedburg Road;
- I-26 WB Freeway Segment between Jedburg Road & Volvo Car Drive;
- I-26 WB Diverge to Volvo Car Drive;
- I-26 WB Freeway Segment between Volvo Car Drive interchange ramps;
- I-26 WB Freeway Segment between Volvo Car Drive & SC 27;
- I-26 WB Diverge to SC 27;
- I-26 WB Diverge to SC 253; and
- I-26 EB Freeway Segment between Volvo Car Drive & Jedburg Road.

Additionally, several intersections are anticipated to operate at undesirable levels of service in both peak hours in the 2043 No Build conditions, including:

- Jedburg Road & Old Dairy Road;
- Jedburg Road & Drop Off Drive;
- SC 27 & I-26 EB Ramps; and
- SC 27 & I-26 WB Ramps.

Additionally, one segment of two-lane Class III highway is anticipated to operate at an undesirable level of service in the 2043 No Build Conditions:

- Jedburg Road south of I-26



I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

Capacity Analysis

June 2019

6.4 2023 AND 2043 BUILD CONDITIONS

Four Build Alternatives were analyzed (both in the opening year and design year). Each of the four alternatives includes widening I-26 from four lanes to six lanes between mile markers 187 and 194. What differentiates each alternative is the interchange type at the I-26 & SC 27 interchange:

- Alternative 1: Rural Diamond;
- Alternative 2: Partial Cloverleaf (Parco-B);
- Alternative 3: Single Loop; and
- Alternative 4: Diamond Roundabout.

The following sections detail the LOS results for each build alternative. Concepts of each of the alternatives can be seen in Section 2.2.3.

6.4.1 Alternative 1 – Rural Diamond Interchange

Table 22 and Table 23 show the resulting LOS for 2023 and 2043 Build Alternative 1, respectively, throughout the study area. Interstate sections are listed first, beginning with eastbound sections first (starting west of SC 453 and proceeding eastward), followed by westbound sections (starting east of Jedburg Road and proceeding westward). Basic freeway segments are designated by “FS”, Diverges by “D”, and Merges by “M”. Two-lane highway sections are listed next, followed by intersections. For intersections, two-way-stop-controlled intersections are designated by “TWSC” and signalized intersections by “SIGNAL”. The inputs used to obtain these results are provided in Appendix B.4 and B.5, along with diagrams showing the locations of the analysis items. The HCS results sheets are provided in Appendix C.4 and C.5 and the Intersection results sheets are provided in Appendix D.4 and D.5.

Table 22 – 2023 Build Alternative 1 LOS Analysis Results

Analysis Item			AM		PM	
			LOS	Density/ PFFS/ Delay	LOS	Density/ PFFS/ Delay
No.	Type	Description				
Interstate Section (Density – pc/mi/ln)						
FSEB1	FS	I-26 EB West of SC 453	B	13.4	B	16.4
DEB1	D	I-26 EB SC 453 Off-Ramp	B	16.2	B	19.8
FSEB2	FS	I-26 EB at SC 453	B	12.1	B	15.1
MEB1	M	I-26 EB SC 453 On-Ramp	B	15.9	B	19.6
FSEB3	FS	I-26 EB Between SC 453 and SC 27	B	13.2	B	16.4
DEB2	D	I-26 EB SC 27 Off-Ramp	B	14.4	B	17.0
FSEB4	FS	I-26 EB at SC 27	A	8.2	A	10.2
MEB2	M	I-26 EB SC 27 On-Ramp	B	12.9	B	15.0
FSEB5	FS	I-26 EB Between SC 27 and Volvo	A	10.9	B	12.8



I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

Capacity Analysis

June 2019

Table 22 – 2023 Build Alternative 1 LOS Analysis Results (cont.)

Analysis Item			AM		PM	
			LOS	Density/ PFFS/ Delay	LOS	Density/ PFFS/ Delay
No.	Type	Description				
DEB3	D	I-26 EB Volvo Off-Ramp	A	8.4	B	10.6
FSEB6	FS	I-26 EB at Volvo	A	10.4	B	12.7
MEB3	M	I-26 EB Volvo On-Ramp	A	0.0	A	0.0
FSEB7	FS	I-26 EB Between Volvo & Jedburg	A	10.9	B	14.6
DEB4	D	I-26 EB Jedburg Off-Ramp	B	17.7	C	22.0
FSEB8	FS	I-26 EB at Jedburg	A	10.1	B	13.8
MEB4	M	I-26 EB Jedburg On-Ramp	B	16.7	B	18.6
FSEB9	FS	I-26 EB East of Jedburg	B	15.9	C	18.3
FSWB1	FS	I-26 WB East of Jedburg	B	16.7	C	20.9
DWB1	D	I-26 WB Jedburg Off-Ramp	C	23.4	C	27.7
FSWB2	FS	I-26 WB At Jedburg	B	14.8	C	18.3
DWB1.1	---	I-26 WB Jedburg Loop Off-Ramp	B	16.5	C	20.6
FSWB2.1	---	I-26 WB west of Loop Off-Ramp	B	13.1	B	14.7
MWB1	M	I-26 WB Jedburg On-Ramp	B	11.5	B	13.2
FSWB3	FS	I-26 WB Between Jedburg and Volvo	B	13.9	B	15.6
DWB2	D	I-26 WB Volvo Off-Ramp	A	0.0	A	0.0
FSWB4	FS	I-26 WB At Volvo	B	11.7	B	14.9
MWB2	M	I-26 WB Volvo On-Ramp	A	9.0	B	13.0
FSWB5	FS	I-26 WB Between Volvo and SC 27	B	11.9	B	15.4
DWB3	D	I-26 WB SC 27 Off-Ramp	B	18.7	C	23.0
FSWB6	FS	I-26 WB at SC 27	A	9.9	B	12.7
MWB3	M	I-26 WB SC 27 On-Ramp	B	11.3	B	14.6
FSWB7	FS	I-26 WB Between SC 27 and SC 453	B	15.8	C	21.2
DWB4	D	I-26 WB SC 453 Off-Ramp	C	20.3	C	26.2
FSWB8	FS	I-26 WB at SC 453	B	14.4	C	19.6
MWB4	M	I-26 WB SC 453 On-Ramp	B	17.8	C	23.2
FSWB9	FS	I-26 WB West of SC 453	B	16.4	C	21.1
Two-Lane Highway Section (Percent Free-Flow Speed – %)						
TLNB1	III	Jedburg Road North of I-26 (NB)	C	78.1%	C	75.8%
TLNB1	III	Jedburg Road North of I-26 (SB)	C	75.8%	C	77.4%
TLNB2	III	Jedburg Road South of I-26 (NB)	D	71.6%	D	68.8%



I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

Capacity Analysis

June 2019

Table 22 – 2023 Build Alternative 1 LOS Analysis Results (cont.)

Analysis Item			AM		PM	
			LOS	Density/ PFFS/ Delay	LOS	Density/ PFFS/ Delay
No.	Type	Description				
TLSB2	III	Jedburg Road South of I-26 (SB)	D	73.1%	D	68.3%
TLNB3	III	Volvo Car Drive (NB)	B	88.1%	B	87.2%
TLSB3	III	Volvo Car Drive (SB)	B	87.7%	B	86.8%
TLNB4	III	SC 27 North of I-26 (NB)	C	78.0%	C	75.4%
TLSB4	III	SC 27 North of I-26 (SB)	C	78.4%	D	74.1%
TLNB5	III	SC 27 South of I-26 (NB)	C	78.9%	C	79.7%
TLSB5	III	SC 27 South of I-26 (SB)	C	80.3%	C	78.9%
TLNB6	III	SC 453 North of I-26 (NB)	B	83.4%	C	82.8%
TLSB6	III	SC 453 North of I-26 (SB)	C	83.2%	C	82.5%
TLNB7	III	SC 453 South of I-26 (NB)	C	81.1%	C	81.5%
TLSB7	III	SC 453 South of I-26 (SB)	C	81.6%	C	80.1%
Intersection (Delay – sec/veh)						
1	TWSC	Jedburg Road & Old Dairy Road	F	280.6 (EB)	F	> 300 (EB)
2	SIGNAL	Jedburg Road & I-26 EB Ramps	B	13.1	A	8.8
3	SIGNAL	Jedburg Road & I-26 WB Ramps	A	2.6	A	2.6
4	TWSC	Jedburg Road & Drop Off Drive	D	25.0 (WB)	D	31.4 (WB)
5	TWSC	SC 27 & Emma Lane	B	14.3 (WB)	C	16.1 (WB)
6	TWSC	SC 27 & Miles Lane	B	13.5 (EB)	C	17.3 (EB)
7	SIGNAL	SC 27 & I-26 WB Ramps	B	11.0	B	12.6
8	SIGNAL	SC 27 & I-26 EB Ramps	A	7.8	A	6.7
9	TWSC	SC 27 & Interstate Drive	A	0.0 (EB)	C	18.0 (EB)
10	TWSC	SC 27 & Jared Lane	B	11.8 (WB)	B	12.5 (WB)
11	TWSC	SC 453 & 7 Mile Road	B	12.3 (WB)	B	14.5 (WB)
12	TWSC	SC 453 & I-26 WB Ramps	B	12.0 (WB)	B	12.6 (WB)
13	TWSC	SC 453 & I-26 EB Ramps	B	12.5 (EB)	B	12.8 (EB)
14	TWSC	SC 453 & US 178	B	13.5 (SB)	C	15.8 (SB)
15	SIGNAL	Volvo Car Drive & Factory Entrance	B	12.6	B	16.4

The results of the 2023 Build Alternative 1 LOS analysis indicate that all interstate sections, two-lane highway segments, and intersections in the study area are anticipated to operate at acceptable levels of service in the opening year, with one exception. The intersection of Jedburg Road & Old Dairy Road, as a two-way-stop-controlled intersection, is projected to experience undesirable delay in both the AM and PM peak hours in the opening year.



I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

Capacity Analysis

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Table 23 – 2043 Build Alternative 1 LOS Analysis Results

Analysis Item			AM		PM	
			LOS	Density/ PFFS/ Delay	LOS	Density/ PFFS/ Delay
No.	Type	Description				
Interstate Section (Density – pc/mi/ln)						
FSEB1	FS	I-26 EB West of SC 453	B	17.5	C	21.6
DEB1	D	I-26 EB SC 453 Off-Ramp	C	21.1	C	25.8
FSEB2	FS	I-26 EB at SC 453	B	15.9	C	20.3
MEB1	M	I-26 EB SC 453 On-Ramp	C	20.6	C	25.0
FSEB3	FS	I-26 EB Between SC 453 and SC 27	B	17.4	C	22.2
DEB2	D	I-26 EB SC 27 Off-Ramp	B	17.8	C	20.9
FSEB4	FS	I-26 EB at SC 27	A	10.5	B	13.1
MEB2	M	I-26 EB SC 27 On-Ramp	B	17.1	B	19.7
FSEB5	FS	I-26 EB Between SC 27 and Volvo	B	14.3	B	16.8
DEB3	D	I-26 EB Volvo Off-Ramp	B	12.6	B	15.1
FSEB6	FS	I-26 EB at Volvo	B	13.3	B	16.3
MEB3	M	I-26 EB Volvo On-Ramp	A	0.0	A	0.0
FSEB7	FS	I-26 EB Between Volvo & Jedburg	B	16.1	C	20.0
DEB4	D	I-26 EB Jedburg Off-Ramp	C	23.7	C	27.4
FSEB8	FS	I-26 EB at Jedburg	B	15.0	C	18.8
MEB4	M	I-26 EB Jedburg On-Ramp	C	24.0	C	25.0
FSEB9	FS	I-26 EB East of Jedburg	C	23.1	C	25.2
FSWB1	FS	I-26 WB East of Jedburg	C	23.2	D	31.9
DWB1	D	I-26 WB Jedburg Off-Ramp	D	29.4	E	35.5
FSWB2	FS	I-26 WB At Jedburg	C	20.9	D	27.9
DWB1.1	---	I-26 WB Jedburg Loop Off-Ramp	C	22.4	C	27.6
FSWB2.1	---	I-26 WB west of Loop Off-Ramp	C	18.2	C	21.7
MWB1	M	I-26 WB Jedburg On-Ramp	B	16.7	B	19.4
FSWB3	FS	I-26 WB Between Jedburg and Volvo	C	19.4	C	23.1
DWB2	D	I-26 WB Volvo Off-Ramp	A	0.0	A	0.0
FSWB4	FS	I-26 WB At Volvo	B	15.0	C	20.7
MWB2	M	I-26 WB Volvo On-Ramp	B	13.4	B	19.1
FSWB5	FS	I-26 WB Between Volvo and SC 27	B	15.7	C	21.7
DWB3	D	I-26 WB SC 27 Off-Ramp	C	23.4	D	29.0
FSWB6	FS	I-26 WB at SC 27	B	12.9	B	17.4



I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

Capacity Analysis

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Table 23 – 2043 Build Alternative 1 LOS Analysis Results (cont.)

Analysis Item			AM		PM	
			LOS	Density/ PFFS/ Delay	LOS	Density/ PFFS/ Delay
No.	Type	Description				
MWB3	M	I-26 WB SC 27 On-Ramp	B	15.0	B	19.9
FSWB7	FS	I-26 WB Between SC 27 and SC 453	C	21.6	D	33.0
DWB4	D	I-26 WB SC 453 Off-Ramp	C	26.6	E	35.4
FSWB8	FS	I-26 WB at SC 453	C	19.7	D	29.9
MWB4	M	I-26 WB SC 453 On-Ramp	C	23.4	D	31.5
FSWB9	FS	I-26 WB West of SC 453	C	21.3	D	31.6
Two-Lane Highway Section (Percent Free-Flow Speed – %)						
TLNB1	III	Jedburg Road North of I-26 (NB)	D	74.3%	D	71.9%
TLSB1	III	Jedburg Road North of I-26 (SB)	D	72.0%	D	73.5%
TLNB2	III	Jedburg Road South of I-26 (NB)	E	65.8%	E	60.9%
TLSB2	III	Jedburg Road South of I-26 (SB)	E	66.7%	E	60.8%
TLNB3	III	Volvo Car Drive (NB)	D	71.7%	C	77.7%
TLSB3	III	Volvo Car Drive (SB)	D	71.8%	C	76.7%
TLNB4	III	SC 27 North of I-26 (NB)	D	74.7%	D	70.0%
TLSB4	III	SC 27 North of I-26 (SB)	C	75.1%	D	69.0%
TLNB5	III	SC 27 South of I-26 (NB)	D	74.2%	D	74.9%
TLSB5	III	SC 27 South of I-26 (SB)	C	75.7%	D	74.0%
TLNB6	III	SC 453 North of I-26 (NB)	C	81.1%	C	82.0%
TLSB6	III	SC 453 North of I-26 (SB)	C	82.5%	C	81.5%
TLNB7	III	SC 453 South of I-26 (NB)	C	80.1%	C	80.4%
TLSB7	III	SC 453 South of I-26 (SB)	C	80.7%	C	78.8%
Intersection (Delay – sec/veh)						
1	TWSC	Jedburg Road & Old Dairy Road	F	> 300 (EB)	F	> 300 (EB)
2	SIGNAL	Jedburg Road & I-26 EB Ramps	C	34.1	B	11.2
3	SIGNAL	Jedburg Road & I-26 WB Ramps	A	2.5	A	2.6
4	TWSC	Jedburg Road & Drop Off Drive	F	52.0 (WB)	F	109.4 (WB)
5	TWSC	SC 27 & Emma Lane	C	17.9 (WB)	C	22.2 (WB)
6	TWSC	SC 27 & Miles Lane	C	16.3 (EB)	C	23.9 (EB)
7	SIGNAL	SC 27 & I-26 WB Ramps	B	13.6	B	17.8
8	SIGNAL	SC 27 & I-26 EB Ramps	A	8.6	A	7.5
9	TWSC	SC 27 & Interstate Drive	A	0.0 (EB)	D	25.2 (EB)



I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

Capacity Analysis

June 2019

Table 23 – 2043 Build Alternative 1 LOS Analysis Results (cont.)

Analysis Item			AM		PM	
			LOS	Density/ PFFS/ Delay	LOS	Density/ PFFS/ Delay
No.	Type	Description				
10	TWSC	SC 27 & Jared Lane	B	13.2 (WB)	C	15.7 (WB)
11	TWSC	SC 453 & 7 Mile Road	B	13.5 (WB)	C	17.6 (WB)
12	TWSC	SC 453 & I-26 WB Ramps	B	13.2 (WB)	B	14.5 (WB)
13	TWSC	SC 453 & I-26 EB Ramps	B	13.8 (EB)	B	14.3 (EB)
14	TWSC	SC 453 & US 178	C	15.7 (SB)	C	20.6 (SB)
15	SIGNAL	Volvo Car Drive & Factory Entrance	C	22.0	C	21.8

The results of the 2043 Build Alternative 1 LOS analysis indicate that all interstate sections, are anticipated to operate at acceptable levels of service in the design year, with two exceptions:

- I-26 WB Diverge to Jedburg Road; and
- I-26 WB Diverge to SC 453.

Additionally, all study area intersections are anticipated to operate at acceptable levels of service in both peak hours in the design year, with two exceptions:

- Jedburg Road & Old Dairy Road; and
- Jedburg Road & Drop Off Drive.

Additionally, all segments of two-lane Class III highway are anticipated to operate at acceptable levels of service in the design year, with one exception:

- Jedburg Road South of I-26.



I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

Capacity Analysis

June 2019

6.4.2 Alternative 2 – Partial Cloverleaf (Parclo-B)

Table 24 and Table 25 show the resulting LOS for 2023 and 2043 Build Alternative 2, respectively, throughout the study area. The inputs used to obtain these results are provided in Appendix B.6 and B.7, along with diagrams showing the locations of the analysis items. The HCS results sheets are provided in Appendix C.6 and C.7 and the Intersection results sheets are provided in Appendix D.6 and D.7.

Table 24 – 2023 Build Alternative 2 LOS Analysis Results

Analysis Item			AM		PM	
			LOS	Density/ PFFS/ Delay	LOS	Density/ PFFS/ Delay
No.	Type	Description				
Interstate Section (Density – pc/mi/ln)						
FSEB1	FS	I-26 EB West of SC 453	B	13.4	B	16.4
DEB1	D	I-26 EB SC 453 Off-Ramp	B	16.2	B	19.8
FSEB2	FS	I-26 EB at SC 453	B	12.1	B	15.1
MEB1	M	I-26 EB SC 453 On-Ramp	B	15.9	B	19.6
FSEB3	FS	I-26 EB Between SC 453 and SC 27	B	13.2	B	16.4
DEB2	D	I-26 EB SC 27 Off-Ramp	B	14.3	B	16.9
FSEB4	FS	I-26 EB at SC 27	A	8.4	A	10.3
DEB2.1	D	I-26 EB SC 27 Loop Off-Ramp	A	10.0	B	12.4
FSEB4.1	FS	I-26 EB East of SC 27 Loop Off-Ramp	A	8.2	A	10.2
MEB2	M	I-26 EB SC 27 On-Ramp	B	12.9	B	15.0
FSEB5	FS	I-26 EB Between SC 27 and Volvo	A	10.9	B	12.8
DEB3	D	I-26 EB Volvo Off-Ramp	A	8.4	B	10.6
FSEB6	FS	I-26 EB at Volvo	A	10.4	B	12.7
MEB3	M	I-26 EB Volvo On-Ramp	A	0.0	A	0.0
FSEB7	FS	I-26 EB Between Volvo & Jedburg	A	10.9	B	14.6
DEB4	D	I-26 EB Jedburg Off-Ramp	B	17.7	C	22.0
FSEB8	FS	I-26 EB at Jedburg	A	10.1	B	13.8
MEB4	M	I-26 EB Jedburg On-Ramp	B	16.7	B	18.6
FSEB9	FS	I-26 EB East of Jedburg	B	15.9	C	18.3
FSWB1	FS	I-26 WB East of Jedburg	B	16.7	C	20.9
DWB1	D	I-26 WB Jedburg Off-Ramp	C	23.4	C	27.7
FSWB2	FS	I-26 WB At Jedburg	B	14.8	C	18.3
DWB1.1	---	I-26 WB Jedburg Loop Off-Ramp	B	16.5	C	20.6
FSWB2.1	---	I-26 WB west of Loop Off-Ramp	B	13.1	B	14.7



I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

Capacity Analysis

June 2019

Table 24 – 2023 Build Alternative 2 LOS Analysis Results (cont.)

Analysis Item			AM		PM	
			LOS	Density/ PFFS/ Delay	LOS	Density/ PFFS/ Delay
No.	Type	Description				
MWB1	M	I-26 WB Jedburg On-Ramp	B	11.5	B	13.2
FSWB3	FS	I-26 WB Between Jedburg and Volvo	B	13.9	B	15.6
DWB2	D	I-26 WB Volvo Off-Ramp	A	0.0	A	0.0
FSWB4	FS	I-26 WB At Volvo	B	11.7	B	14.9
MWB2	M	I-26 WB Volvo On-Ramp	A	9.0	B	13.0
FSWB5	FS	I-26 WB Between Volvo and SC 27	B	11.9	B	15.4
DWB3	D	I-26 WB SC 27 Off-Ramp	B	18.3	C	22.5
FSWB6	FS	I-26 WB at SC 27	A	10.8	B	13.9
DWB3.1	D	I-26 WB SC 27 Loop Off-Ramp	B	17.0	B	17.1
FSWB6.1	FS	I-26 WB West of SC 27 Loop Off-Ramp	A	9.9	B	12.7
MWB3	M	I-26 WB SC 27 On-Ramp	B	11.3	B	14.6
FSWB7	FS	I-26 WB Between SC 27 and SC 453	B	15.8	C	21.2
DWB4	D	I-26 WB SC 453 Off-Ramp	C	20.3	C	26.2
FSWB8	FS	I-26 WB at SC 453	B	14.4	C	19.6
MWB4	M	I-26 WB SC 453 On-Ramp	B	17.8	C	23.2
FSWB9	FS	I-26 WB West of SC 453	B	16.4	C	21.1
Two-Lane Highway Section (Percent Free-Flow Speed – %)						
TLNB1	III	Jedburg Road North of I-26 (NB)	C	78.1%	C	75.8%
TLSB1	III	Jedburg Road North of I-26 (SB)	C	75.8%	C	77.4%
TLNB2	III	Jedburg Road South of I-26 (NB)	D	71.6%	D	68.8%
TLSB2	III	Jedburg Road South of I-26 (SB)	D	73.1%	D	68.3%
TLNB3	III	Volvo Car Drive (NB)	B	88.1%	B	87.2%
TLSB3	III	Volvo Car Drive (SB)	B	87.7%	B	86.8%
TLNB4	III	SC 27 North of I-26 (NB)	C	78.0%	C	75.4%
TLSB4	III	SC 27 North of I-26 (SB)	C	78.4%	D	74.1%
TLNB5	III	SC 27 South of I-26 (NB)	C	78.9%	C	79.7%
TLSB5	III	SC 27 South of I-26 (SB)	C	80.3%	C	78.9%
TLNB6	III	SC 453 North of I-26 (NB)	B	83.4%	C	82.8%
TLSB6	III	SC 453 North of I-26 (SB)	C	83.2%	C	82.5%
TLNB7	III	SC 453 South of I-26 (NB)	C	81.1%	C	81.5%
TLSB7	III	SC 453 South of I-26 (SB)	C	81.6%	C	80.1%



I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

Capacity Analysis

June 2019

Table 24 – 2023 Build Alternative 2 LOS Analysis Results (cont.)

Analysis Item			AM		PM	
			LOS	Density/ PFFS/ Delay	LOS	Density/ PFFS/ Delay
No.	Type	Description				
Intersection (Delay – sec/veh)						
1	TWSC	Jedburg Road & Old Dairy Road	F	280.6 (EB)	F	> 300 (EB)
2	SIGNAL	Jedburg Road & I-26 EB Ramps	B	13.1	A	8.8
3	SIGNAL	Jedburg Road & I-26 WB Ramps	A	2.6	A	2.6
4	TWSC	Jedburg Road & Drop Off Drive	D	25.0 (WB)	D	31.4 (WB)
5	---	SC 27 & Emma Lane	---	---	---	---
6	---	SC 27 & Miles Lane	---	---	---	---
7	TWSC	SC 27 & I-26 WB Ramps	C	20.1 (WB)	B	10.0 (WB)
8	TWSC	SC 27 & I-26 EB Ramps	A	3.7 (SB)	A	3.6 (SB)
9	---	SC 27 & Interstate Drive	---	---	---	---
10	TWSC	SC 27 & Jared Lane	B	11.8 (WB)	B	12.5 (WB)
11	TWSC	SC 453 & 7 Mile Road	B	12.3 (WB)	B	14.5 (WB)
12	TWSC	SC 453 & I-26 WB Ramps	B	12.0 (WB)	B	12.6 (WB)
13	TWSC	SC 453 & I-26 EB Ramps	B	12.5 (EB)	B	12.8 (EB)
14	TWSC	SC 453 & US 178	B	13.5 (SB)	C	15.8 (SB)
15	SIGNAL	Volvo Car Drive & Factory Entrance	B	12.6	B	16.4

The results of the 2023 Build Alternative 2 LOS analysis indicate that all interstate sections, two-lane highway segments, and intersections in the study area are anticipated to operate at acceptable levels of service in the opening year, with one exception. The intersection of Jedburg Road & Old Dairy Road, as a two-way-stop-controlled intersection, is projected to experience undesirable delay in both the AM and PM peak hours in the opening year.



I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

Capacity Analysis

June 2019

Table 25 – 2043 Build Alternative 2 LOS Analysis Results

Analysis Item			AM		PM	
			LOS	Density/ PFFS/ Delay	LOS	Density/ PFFS/ Delay
No.	Type	Description				
Interstate Section (Density – pc/mi/ln)						
FSEB1	FS	I-26 EB West of SC 453	B	17.5	C	21.6
DEB1	D	I-26 EB SC 453 Off-Ramp	C	21.1	C	25.8
FSEB2	FS	I-26 EB at SC 453	B	15.9	C	20.3
MEB1	M	I-26 EB SC 453 On-Ramp	C	20.6	C	25.2
FSEB3	FS	I-26 EB Between SC 453 and SC 27	B	17.4	C	22.2
DEB2	D	I-26 EB SC 27 Off-Ramp	B	17.7	C	20.8
FSEB4	FS	I-26 EB at SC 27	A	10.8	B	13.3
DEB2.1	D	I-26 EB SC 27 Loop Off-Ramp	B	13.1	B	16.0
FSEB4.1	FS	I-26 EB East of SC 27 Loop Off-Ramp	A	10.5	B	13.1
MEB2	M	I-26 EB SC 27 On-Ramp	B	17.0	B	19.8
FSEB5	FS	I-26 EB Between SC 27 and Volvo	B	14.3	B	16.8
DEB3	D	I-26 EB Volvo Off-Ramp	B	12.6	B	15.1
FSEB6	FS	I-26 EB at Volvo	B	13.3	B	16.3
MEB3	M	I-26 EB Volvo On-Ramp	A	0.0	A	0.0
FSEB7	FS	I-26 EB Between Volvo & Jedburg	B	16.1	C	20.0
DEB4	D	I-26 EB Jedburg Off-Ramp	C	23.7	C	27.4
FSEB8	FS	I-26 EB at Jedburg	B	15.0	C	18.8
MEB4	M	I-26 EB Jedburg On-Ramp	C	24.0	C	25.0
FSEB9	FS	I-26 EB East of Jedburg	C	23.1	C	25.0
FSWB1	FS	I-26 WB East of Jedburg	C	23.3	D	31.9
DWB1	D	I-26 WB Jedburg Off-Ramp	D	29.4	E	35.5
FSWB2	FS	I-26 WB At Jedburg	C	20.9	D	27.9
DWB1.1	---	I-26 WB Jedburg Loop Off-Ramp	C	22.4	C	27.6
FSWB2.1	---	I-26 WB west of Loop Off-Ramp	C	18.2	C	21.7
MWB1	M	I-26 WB Jedburg On-Ramp	B	16.7	B	19.4
FSWB3	FS	I-26 WB Between Jedburg and Volvo	C	19.4	C	23.1
DWB2	D	I-26 WB Volvo Off-Ramp	A	0.0	A	0.0
FSWB4	FS	I-26 WB At Volvo	B	15.0	C	20.7
MWB2	M	I-26 WB Volvo On-Ramp	B	13.4	B	19.1



I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

Capacity Analysis

June 2019

Table 25 – 2043 Build Alternative 2 LOS Analysis Results (cont.)

Analysis Item			AM		PM	
			LOS	Density/ PFFS/ Delay	LOS	Density/ PFFS/ Delay
No.	Type	Description				
FSWB5	FS	I-26 WB Between Volvo and SC 27	B	15.7	C	21.7
DWB3	D	I-26 WB SC 27 Off-Ramp	C	22.8	D	28.4
FSWB6	FS	I-26 WB at SC 27	B	14.2	C	19.3
DWB3.1	D	I-26 WB SC 27 Loop Off-Ramp	B	17.6	C	22.7
FSWB6.1	FS	I-26 WB West of SC 27 Loop Off-Ramp	B	12.9	B	17.4
MWB3	M	I-26 WB SC 27 On-Ramp	B	14.9	B	19.9
FSWB7	FS	I-26 WB Between SC 27 and SC 453	C	21.6	D	33.0
DWB4	D	I-26 WB SC 453 Off-Ramp	C	26.6	E	35.4
FSWB8	FS	I-26 WB at SC 453	C	19.7	D	29.9
MWB4	M	I-26 WB SC 453 On-Ramp	C	23.4	D	31.5
FSWB9	FS	I-26 WB West of SC 453	C	21.3	D	31.6
Two-Lane Highway Section (Percent Free-Flow Speed – %)						
TLNB1	III	Jedburg Road North of I-26 (NB)	D	74.3%	D	71.9%
TLSB1	III	Jedburg Road North of I-26 (SB)	D	72.0%	D	73.5%
TLNB2	III	Jedburg Road South of I-26 (NB)	E	65.8%	E	60.9%
TLSB2	III	Jedburg Road South of I-26 (SB)	E	66.7%	E	60.8%
TLNB3	III	Volvo Car Drive (NB)	D	71.7%	C	77.7%
TLSB3	III	Volvo Car Drive (SB)	D	71.8%	C	76.7%
TLNB4	III	SC 27 North of I-26 (NB)	D	74.7%	D	70.0%
TLSB4	III	SC 27 North of I-26 (SB)	C	75.1%	D	69.0%
TLNB5	III	SC 27 South of I-26 (NB)	D	74.2%	D	74.9%
TLSB5	III	SC 27 South of I-26 (SB)	C	75.7%	D	74.0%
TLNB6	III	SC 453 North of I-26 (NB)	C	81.1%	C	82.0%
TLSB6	III	SC 453 North of I-26 (SB)	C	82.5%	C	81.5%
TLNB7	III	SC 453 South of I-26 (NB)	C	80.1%	C	80.4%
TLSB7	III	SC 453 South of I-26 (SB)	C	80.7%	C	78.8%
Intersection (Delay – sec/veh)						
1	TWSC	Jedburg Road & Old Dairy Road	F	> 300 (EB)	F	> 300 (EB)
2	SIGNAL	Jedburg Road & I-26 EB Ramps	C	34.1	B	11.2
3	SIGNAL	Jedburg Road & I-26 WB Ramps	A	2.5	A	2.6



I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

Capacity Analysis

June 2019

Table 25 – 2043 Build Alternative 2 LOS Analysis Results (cont.)

Analysis Item			AM		PM	
			LOS	Density/ PFFS/ Delay	LOS	Density/ PFFS/ Delay
No.	Type	Description				
4	TWSC	Jedburg Road & Drop Off Drive	F	52.0 (WB)	F	109.4 (WB)
5	---	SC 27 & Emma Lane	---	---	---	---
6	---	SC 27 & Miles Lane	---	---	---	---
7	TWSC	SC 27 & I-26 WB Ramps	A	1.9 (NB)	B	10.5 (WB)
8	TWSC	SC 27 & I-26 EB Ramps	A	4.1 (SB)	A	4.2 (SB)
9	---	SC 27 & Interstate Drive	---	---	---	---
10	TWSC	SC 27 & Jared Lane	B	13.6 (WB)	C	16.2 (WB)
11	TWSC	SC 453 & 7 Mile Road	B	13.5 (WB)	C	17.6 (WB)
12	TWSC	SC 453 & I-26 WB Ramps	B	13.2 (WB)	B	14.5 (WB)
13	TWSC	SC 453 & I-26 EB Ramps	B	13.8 (EB)	B	14.3 (EB)
14	TWSC	SC 453 & US 178	C	15.7 (SB)	C	20.6 (SB)
15	SIGNAL	Volvo Car Drive & Factory Entrance	C	22.0	C	21.8

The results of the 2043 Build Alternative 2 LOS analysis indicate that all interstate sections, are anticipated to operate at acceptable levels of service in the design year, with two exceptions:

- I-26 WB Diverge to Jedburg Road; and
- I-26 WB Diverge to SC 453.

Additionally, all study area intersections are anticipated to operate at acceptable levels of service in both peak hours in the design year, with two exceptions:

- Jedburg Road & Old Dairy Road; and
- Jedburg Road & Drop Off Drive.

Additionally, all segments of two-lane Class III highway are anticipated to operate at acceptable levels of service in the design year, with one exception:

- Jedburg Road South of I-26.



I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

Capacity Analysis

June 2019

6.4.3 Alternative 3 – Single-Loop

Table 26 and Table 27 show the resulting LOS for 2023 and 2043 Build Alternative 3, respectively, throughout the study area. The inputs used to obtain these results are provided in Appendix B.8 and B.9, along with diagrams showing the locations of the analysis items. The HCS results sheets are provided in Appendix C.8 and C.9 and the Intersection results sheets are provided in Appendix D.8 and D.9.

Table 26 – 2023 Build Alternative 3 LOS Analysis Results

Analysis Item			AM		PM	
			LOS	Density/ PFFS/ Delay	LOS	Density/ PFFS/ Delay
No.	Type	Description				
Interstate Section (Density – pc/mi/ln)						
FSEB1	FS	I-26 EB West of SC 453	B	13.4	B	16.4
DEB1	D	I-26 EB SC 453 Off-Ramp	B	16.2	B	19.8
FSEB2	FS	I-26 EB at SC 453	B	12.1	B	15.1
MEB1	M	I-26 EB SC 453 On-Ramp	B	15.9	B	19.6
FSEB3	FS	I-26 EB Between SC 453 and SC 27	B	13.2	B	16.4
DEB2	D	I-26 EB SC 27 Off-Ramp	B	14.4	B	17.0
FSEB4	FS	I-26 EB at SC 27	A	8.2	A	10.2
MEB2	M	I-26 EB SC 27 On-Ramp	B	12.9	B	15.0
FSEB5	FS	I-26 EB Between SC 27 and Volvo	A	10.9	B	12.8
DEB3	D	I-26 EB Volvo Off-Ramp	A	8.4	B	10.6
FSEB6	FS	I-26 EB at Volvo	A	10.4	B	12.7
MEB3	M	I-26 EB Volvo On-Ramp	A	0.0	A	0.0
FSEB7	FS	I-26 EB Between Volvo & Jedburg	A	10.9	B	14.6
DEB4	D	I-26 EB Jedburg Off-Ramp	B	17.7	C	22.0
FSEB8	FS	I-26 EB at Jedburg	A	10.1	B	13.8
MEB4	M	I-26 EB Jedburg On-Ramp	B	16.7	B	18.6
FSEB9	FS	I-26 EB East of Jedburg	B	15.9	C	18.3
FSWB1	FS	I-26 WB East of Jedburg	B	16.7	C	20.9
DWB1	D	I-26 WB Jedburg Off-Ramp	C	23.4	C	27.7
FSWB2	FS	I-26 WB At Jedburg	B	14.8	C	18.3
DWB1.1	---	I-26 WB Jedburg Loop Off-Ramp	B	16.5	C	20.6
FSWB2.1	---	I-26 WB west of Loop Off-Ramp	B	13.1	B	14.7
MWB1	M	I-26 WB Jedburg On-Ramp	B	11.5	B	13.2



I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

Capacity Analysis

June 2019

Table 26 – 2023 Build Alternative 3 LOS Analysis Results (cont.)

Analysis Item			AM		PM	
			LOS	Density/ PFFS/ Delay	LOS	Density/ PFFS/ Delay
No.	Type	Description				
FSWB3	FS	I-26 WB Between Jedburg and Volvo	B	13.9	B	15.6
DWB2	D	I-26 WB Volvo Off-Ramp	A	0.0	A	0.0
FSWB4	FS	I-26 WB At Volvo	B	11.7	B	14.9
MWB2	M	I-26 WB Volvo On-Ramp	A	9.0	B	13.0
FSWB5	FS	I-26 WB Between Volvo and SC 27	B	11.9	B	15.4
DWB3	D	I-26 WB SC 27 Off-Ramp	B	18.3	C	22.5
FSWB6	FS	I-26 WB at SC 27	A	10.8	B	13.9
DWB3.1	D	I-26 WB SC 27 Loop Off-Ramp	B	17.0	B	17.1
FSWB6.1	FS	I-26 WB West of SC 27 Loop Off-Ramp	A	9.9	B	12.7
MWB3	M	I-26 WB SC 27 On-Ramp	B	11.3	B	14.6
FSWB7	FS	I-26 WB Between SC 27 and SC 453	B	15.8	C	21.2
DWB4	D	I-26 WB SC 453 Off-Ramp	C	20.3	C	26.2
FSWB8	FS	I-26 WB at SC 453	B	14.4	C	19.6
MWB4	M	I-26 WB SC 453 On-Ramp	B	17.8	C	23.2
FSWB9	FS	I-26 WB West of SC 453	B	16.4	C	21.1
Two-Lane Highway Section (Percent Free-Flow Speed – %)						
TLNB1	III	Jedburg Road North of I-26 (NB)	C	78.1%	C	75.8%
TLSB1	III	Jedburg Road North of I-26 (SB)	C	75.8%	C	77.4%
TLNB2	III	Jedburg Road South of I-26 (NB)	D	71.6%	D	68.8%
TLSB2	III	Jedburg Road South of I-26 (SB)	D	73.1%	D	68.3%
TLNB3	III	Volvo Car Drive (NB)	B	88.1%	B	87.2%
TLSB3	III	Volvo Car Drive (SB)	B	87.7%	B	86.8%
TLNB4	III	SC 27 North of I-26 (NB)	C	78.0%	C	75.4%
TLSB4	III	SC 27 North of I-26 (SB)	C	78.4%	D	74.1%
TLNB5	III	SC 27 South of I-26 (NB)	C	78.9%	C	79.7%
TLSB5	III	SC 27 South of I-26 (SB)	C	80.3%	C	78.9%
TLNB6	III	SC 453 North of I-26 (NB)	B	83.4%	C	82.8%
TLSB6	III	SC 453 North of I-26 (SB)	C	83.2%	C	82.5%
TLNB7	III	SC 453 South of I-26 (NB)	C	81.1%	C	81.5%
TLSB7	III	SC 453 South of I-26 (SB)	C	81.6%	C	80.1%



I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

Capacity Analysis

June 2019

Table 26 – 2023 Build Alternative 3 LOS Analysis Results (cont.)

Analysis Item			AM		PM	
			LOS	Density/ PFFS/ Delay	LOS	Density/ PFFS/ Delay
No.	Type	Description				
Intersection (Delay – sec/veh)						
1	TWSC	Jedburg Road & Old Dairy Road	F	280.6 (EB)	F	> 300 (EB)
2	SIGNAL	Jedburg Road & I-26 EB Ramps	B	13.1	A	8.8
3	SIGNAL	Jedburg Road & I-26 WB Ramps	A	2.6	A	2.6
4	TWSC	Jedburg Road & Drop Off Drive	D	25.0 (WB)	D	31.4 (WB)
5	---	SC 27 & Emma Lane	---	---	---	---
6	---	SC 27 & Miles Lane	---	---	---	---
7	TWSC	SC 27 & I-26 WB Ramps	C	20.1 (WB)	B	10.0 (WB)
8	TWSC	SC 27 & I-26 EB Ramps	A	7.8	A	6.7
9	---	SC 27 & Interstate Drive	---	---	---	---
10	TWSC	SC 27 & Jared Lane	B	11.8 (WB)	B	12.5 (WB)
11	TWSC	SC 453 & 7 Mile Road	B	12.3 (WB)	B	14.5 (WB)
12	TWSC	SC 453 & I-26 WB Ramps	B	12.0 (WB)	B	12.6 (WB)
13	TWSC	SC 453 & I-26 EB Ramps	B	12.5 (EB)	B	12.8 (EB)
14	TWSC	SC 453 & US 178	B	13.5 (SB)	C	15.8 (SB)
15	SIGNAL	Volvo Car Drive & Factory Entrance	B	12.6	B	16.4

The results of the 2023 Build Alternative 3 LOS analysis indicate that all interstate sections, two-lane highway segments, and intersections in the study area are anticipated to operate at acceptable levels of service in the opening year, with one exception. The intersection of Jedburg Road & Old Dairy Road, as a two-way-stop-controlled intersection, is projected to experience undesirable delay in both the AM and PM peak hours in the opening year.



I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

Capacity Analysis

June 2019

Table 27 – 2043 Build Alternative 3 LOS Analysis Results

Analysis Item			AM		PM	
			LOS	Density/ PFFS/ Delay	LOS	Density/ PFFS/ Delay
No.	Type	Description				
Interstate Section (Density – pc/mi/ln)						
FSEB1	FS	I-26 EB West of SC 453	B	17.5	C	21.6
DEB1	D	I-26 EB SC 453 Off-Ramp	C	21.1	C	25.8
FSEB2	FS	I-26 EB at SC 453	B	15.9	C	20.3
MEB1	M	I-26 EB SC 453 On-Ramp	C	20.6	C	25.0
FSEB3	FS	I-26 EB Between SC 453 and SC 27	B	17.4	C	22.2
DEB2	D	I-26 EB SC 27 Off-Ramp	B	17.8	C	20.9
FSEB4	FS	I-26 EB at SC 27	A	10.5	B	13.1
MEB2	M	I-26 EB SC 27 On-Ramp	B	17.1	B	19.7
FSEB5	FS	I-26 EB Between SC 27 and Volvo	B	14.3	B	16.8
DEB3	D	I-26 EB Volvo Off-Ramp	B	12.6	B	15.1
FSEB6	FS	I-26 EB at Volvo	B	13.3	B	16.3
MEB3	M	I-26 EB Volvo On-Ramp	A	0.0	A	0.0
FSEB7	FS	I-26 EB Between Volvo & Jedburg	B	16.1	C	20.0
DEB4	D	I-26 EB Jedburg Off-Ramp	C	23.7	C	27.4
FSEB8	FS	I-26 EB at Jedburg	B	15.0	C	18.8
MEB4	M	I-26 EB Jedburg On-Ramp	C	24.0	C	25.0
FSEB9	FS	I-26 EB East of Jedburg	C	23.1	C	25.2
FSWB1	FS	I-26 WB East of Jedburg	C	23.3	D	31.9
DWB1	D	I-26 WB Jedburg Off-Ramp	D	29.4	E	35.5
FSWB2	FS	I-26 WB At Jedburg	C	20.9	D	27.9
DWB1.1	---	I-26 WB Jedburg Loop Off-Ramp	C	22.4	C	27.6
FSWB2.1	---	I-26 WB west of Loop Off-Ramp	C	18.2	C	21.7
MWB1	M	I-26 WB Jedburg On-Ramp	B	16.7	B	19.4
FSWB3	FS	I-26 WB Between Jedburg and Volvo	C	19.4	C	23.1
DWB2	D	I-26 WB Volvo Off-Ramp	A	0.0	A	0.0
FSWB4	FS	I-26 WB At Volvo	B	15.0	C	20.7
MWB2	M	I-26 WB Volvo On-Ramp	B	13.4	B	19.1
FSWB5	FS	I-26 WB Between Volvo and SC 27	B	15.7	C	21.7
DWB3	D	I-26 WB SC 27 Off-Ramp	C	22.8	D	28.4



I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

Capacity Analysis

June 2019

Table 27 – 2043 Build Alternative 3 LOS Analysis Results (cont.)

Analysis Item			AM		PM	
			LOS	Density/ PFFS/ Delay	LOS	Density/ PFFS/ Delay
No.	Type	Description				
FSWB6	FS	I-26 WB at SC 27	B	14.2	C	19.3
DWB3.1	D	I-26 WB SC 27 Loop Off-Ramp	B	17.6	C	22.7
FSWB6.1	FS	I-26 WB West of SC 27 Loop Off-Ramp	B	12.9	B	17.4
MWB3	M	I-26 WB SC 27 On-Ramp	B	14.9	B	19.9
FSWB7	FS	I-26 WB Between SC 27 and SC 453	C	21.6	D	33.0
DWB4	D	I-26 WB SC 453 Off-Ramp	C	26.6	E	35.4
FSWB8	FS	I-26 WB at SC 453	C	19.7	D	29.9
MWB4	M	I-26 WB SC 453 On-Ramp	C	23.4	D	31.5
FSWB9	FS	I-26 WB West of SC 453	C	21.3	D	31.6
Two-Lane Highway Section (Percent Free-Flow Speed – %)						
TLNB1	III	Jedburg Road North of I-26 (NB)	D	74.3%	D	71.9%
TLSB1	III	Jedburg Road North of I-26 (SB)	D	72.0%	D	73.5%
TLNB2	III	Jedburg Road South of I-26 (NB)	E	65.8%	E	60.9%
TLSB2	III	Jedburg Road South of I-26 (SB)	E	66.7%	E	60.8%
TLNB3	III	Volvo Car Drive (NB)	D	71.7%	C	77.7%
TLSB3	III	Volvo Car Drive (SB)	D	71.8%	C	76.7%
TLNB4	III	SC 27 North of I-26 (NB)	D	74.7%	D	70.0%
TLSB4	III	SC 27 North of I-26 (SB)	C	75.1%	D	69.0%
TLNB5	III	SC 27 South of I-26 (NB)	D	74.2%	D	74.9%
TLSB5	III	SC 27 South of I-26 (SB)	C	75.7%	D	74.0%
TLNB6	III	SC 453 North of I-26 (NB)	C	81.1%	C	82.0%
TLSB6	III	SC 453 North of I-26 (SB)	C	82.5%	C	81.5%
TLNB7	III	SC 453 South of I-26 (NB)	C	80.1%	C	80.4%
TLSB7	III	SC 453 South of I-26 (SB)	C	80.7%	C	78.8%
Intersection (Delay – sec/veh)						
1	TWSC	Jedburg Road & Old Dairy Road	F	> 300 (EB)	F	> 300 (EB)
2	SIGNAL	Jedburg Road & I-26 EB Ramps	C	34.1	B	11.2
3	SIGNAL	Jedburg Road & I-26 WB Ramps	A	2.5	A	2.6
4	TWSC	Jedburg Road & Drop Off Drive	F	52.0 (WB)	F	109.4 (WB)
5	---	SC 27 & Emma Lane	---	---	---	---



I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

Capacity Analysis

June 2019

Table 27 – 2043 Build Alternative 3 LOS Analysis Results (cont.)

Analysis Item			AM		PM	
			LOS	Density/ PFFS/ Delay	LOS	Density/ PFFS/ Delay
No.	Type	Description				
6	---	SC 27 & Miles Lane	---	---	---	---
7	TWSC	SC 27 & I-26 WB Ramps	A	1.9 (NB)	B	10.5 (WB)
8	TWSC	SC 27 & I-26 EB Ramps	A	8.6	A	7.3
9	---	SC 27 & Interstate Drive	---	---	---	---
10	TWSC	SC 27 & Jared Lane	B	13.6 (WB)	C	16.3 (WB)
11	TWSC	SC 453 & 7 Mile Road	B	13.5 (WB)	C	17.6 (WB)
12	TWSC	SC 453 & I-26 WB Ramps	B	13.2 (WB)	B	14.5 (WB)
13	TWSC	SC 453 & I-26 EB Ramps	B	13.8 (EB)	B	14.3 (EB)
14	TWSC	SC 453 & US 178	C	15.7 (SB)	C	20.6 (SB)
15	SIGNAL	Volvo Car Drive & Factory Entrance	C	22.0	C	21.8

The results of the 2043 Build Alternative 3 LOS analysis indicate that all interstate sections, are anticipated to operate at acceptable levels of service in the design year, with two exceptions:

- I-26 WB Diverge to Jedburg Road; and
- I-26 WB Diverge to SC 453.

Additionally, all study area intersections are anticipated to operate at acceptable levels of service in both peak hours in the design year, with two exceptions:

- Jedburg Road & Old Dairy Road; and
- Jedburg Road & Drop Off Drive.

Additionally, all segments of two-lane Class III highway are anticipated to operate at acceptable levels of service in the design year, with one exception:

- Jedburg Road South of I-26.



I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

Capacity Analysis

June 2019

6.4.4 Alternative 4 – Diamond Roundabout

Table 28 and Table 29 show the resulting LOS for 2023 and 2043 Build Alternative 4, respectively, throughout the study area. The inputs used to obtain these results are provided in Appendix B.10 and B.11, along with diagrams showing the locations of the analysis items. The HCS results sheets are provided in Appendix C.10 and C.11 and the Intersection results sheets are provided in Appendix D.10 and D.11.

Table 28 – 2023 Build Alternative 4 LOS Analysis Results

Analysis Item			AM		PM	
			LOS	Density/ PFFS/ Delay	LOS	Density/ PFFS/ Delay
No.	Type	Description				
Interstate Section (Density – pc/mi/ln)						
FSEB1	FS	I-26 EB West of SC 453	B	13.4	B	16.4
DEB1	D	I-26 EB SC 453 Off-Ramp	B	16.2	B	19.8
FSEB2	FS	I-26 EB at SC 453	B	12.1	B	15.1
MEB1	M	I-26 EB SC 453 On-Ramp	B	15.9	B	19.6
FSEB3	FS	I-26 EB Between SC 453 and SC 27	B	13.2	B	16.4
DEB2	D	I-26 EB SC 27 Off-Ramp	B	14.4	B	17.0
FSEB4	FS	I-26 EB at SC 27	A	8.2	A	10.2
MEB2	M	I-26 EB SC 27 On-Ramp	B	12.9	B	15.0
FSEB5	FS	I-26 EB Between SC 27 and Volvo	A	10.9	B	12.8
DEB3	D	I-26 EB Volvo Off-Ramp	A	8.4	B	10.6
FSEB6	FS	I-26 EB at Volvo	A	10.4	B	12.7
MEB3	M	I-26 EB Volvo On-Ramp	A	0.0	A	0.0
FSEB7	FS	I-26 EB Between Volvo & Jedburg	A	10.9	B	14.6
DEB4	D	I-26 EB Jedburg Off-Ramp	B	17.7	C	22.0
FSEB8	FS	I-26 EB at Jedburg	A	10.1	B	13.8
MEB4	M	I-26 EB Jedburg On-Ramp	B	16.7	B	18.6
FSEB9	FS	I-26 EB East of Jedburg	B	15.9	C	18.3
FSWB1	FS	I-26 WB East of Jedburg	B	16.7	C	20.9
DWB1	D	I-26 WB Jedburg Off-Ramp	C	23.4	C	27.7
FSWB2	FS	I-26 WB At Jedburg	B	14.8	C	18.3
DWB1.1	---	I-26 WB Jedburg Loop Off-Ramp	B	16.5	C	20.6
FSWB2.1	---	I-26 WB west of Loop Off-Ramp	B	13.1	B	14.7
MWB1	M	I-26 WB Jedburg On-Ramp	B	11.5	B	13.2



I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

Capacity Analysis

June 2019

Table 28 – 2023 Build Alternative 4 LOS Analysis Results (cont.)

Analysis Item			AM		PM	
			LOS	Density/ PFFS/ Delay	LOS	Density/ PFFS/ Delay
No.	Type	Description				
FSWB3	FS	I-26 WB Between Jedburg and Volvo	B	13.9	B	15.6
DWB2	D	I-26 WB Volvo Off-Ramp	A	0.0	A	0.0
FSWB4	FS	I-26 WB At Volvo	B	11.7	B	14.9
MWB2	M	I-26 WB Volvo On-Ramp	A	9.0	B	13.0
FSWB5	FS	I-26 WB Between Volvo and SC 27	B	11.9	B	15.4
DWB3	D	I-26 WB SC 27 Off-Ramp	B	18.7	C	23.0
FSWB6	FS	I-26 WB at SC 27	A	9.9	B	12.7
MWB3	M	I-26 WB SC 27 On-Ramp	B	11.3	B	14.6
FSWB7	FS	I-26 WB Between SC 27 and SC 453	B	15.8	C	21.2
DWB4	D	I-26 WB SC 453 Off-Ramp	C	20.3	C	26.2
FSWB8	FS	I-26 WB at SC 453	B	14.4	C	19.6
MWB4	M	I-26 WB SC 453 On-Ramp	B	17.8	C	23.2
FSWB9	FS	I-26 WB West of SC 453	B	16.4	C	21.1
Two-Lane Highway Section (Percent Free-Flow Speed – %)						
TLNB1	III	Jedburg Road North of I-26 (NB)	C	78.1%	C	75.8%
TLSB1	III	Jedburg Road North of I-26 (SB)	C	75.8%	C	77.4%
TLNB2	III	Jedburg Road South of I-26 (NB)	D	71.6%	D	68.8%
TLSB2	III	Jedburg Road South of I-26 (SB)	D	73.1%	D	68.3%
TLNB3	III	Volvo Car Drive (NB)	B	88.1%	B	87.2%
TLSB3	III	Volvo Car Drive (SB)	B	87.7%	B	86.8%
TLNB4	III	SC 27 North of I-26 (NB)	C	78.0%	C	75.4%
TLSB4	III	SC 27 North of I-26 (SB)	C	78.4%	D	74.1%
TLNB5	III	SC 27 South of I-26 (NB)	C	78.9%	C	79.7%
TLSB5	III	SC 27 South of I-26 (SB)	C	80.3%	C	78.9%
TLNB6	III	SC 453 North of I-26 (NB)	B	83.4%	C	82.8%
TLSB6	III	SC 453 North of I-26 (SB)	C	83.2%	C	82.5%
TLNB7	III	SC 453 South of I-26 (NB)	C	81.1%	C	81.5%
TLSB7	III	SC 453 South of I-26 (SB)	C	81.6%	C	80.1%
Intersection (Delay – sec/veh)						
1	TWSC	Jedburg Road & Old Dairy Road	F	280.6 (EB)	F	> 300 (EB)



I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

Capacity Analysis

June 2019

Table 28 – 2023 Build Alternative 4 LOS Analysis Results (cont.)

Analysis Item			AM		PM	
			LOS	Density/ PFFS/ Delay	LOS	Density/ PFFS/ Delay
No.	Type	Description				
2	SIGNAL	Jedburg Road & I-26 EB Ramps	B	13.1	A	8.8
3	SIGNAL	Jedburg Road & I-26 WB Ramps	A	2.6	A	2.6
4	TWSC	Jedburg Road & Drop Off Drive	D	25.0 (WB)	D	31.4 (WB)
5	TWSC	SC 27 & Emma Lane	B	14.3 (WB)	C	16.1 (WB)
6	TWSC	SC 27 & Miles Lane	B	13.5 (EB)	C	17.3 (EB)
7	RBT	SC 27 & I-26 WB Ramps	A	5.9	A	6.0
8	RBT	SC 27 & I-26 EB Ramps	A	5.1	A	5.9
9	TWSC	SC 27 & Interstate Drive	A	0.0 (EB)	C	18.0 (EB)
10	TWSC	SC 27 & Jared Lane	B	11.8 (WB)	B	12.5 (WB)
11	TWSC	SC 453 & 7 Mile Road	B	12.3 (WB)	B	14.5 (WB)
12	TWSC	SC 453 & I-26 WB Ramps	B	12.0 (WB)	B	12.6 (WB)
13	TWSC	SC 453 & I-26 EB Ramps	B	12.5 (EB)	B	12.8 (EB)
14	TWSC	SC 453 & US 178	B	13.5 (SB)	C	15.8 (SB)
15	SIGNAL	Volvo Car Drive & Factory Entrance	B	12.6	B	16.4

The results of the 2023 Build Alternative 4 LOS analysis indicate that all interstate sections, two-lane highway segments, and intersections in the study area are anticipated to operate at acceptable levels of service in the opening year, with one exception. The intersection of Jedburg Road & Old Dairy Road, as a two-way-stop-controlled intersection, is projected to experience undesirable delay in both the AM and PM peak hours in the opening year.



I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

Capacity Analysis

June 2019

Table 29 – 2043 Build Alternative 4 LOS Analysis Results

Analysis Item			AM		PM	
			LOS	Density/ PFFS/ Delay	LOS	Density/ PFFS/ Delay
No.	Type	Description				
Interstate Section (Density – pc/mi/ln)						
FSEB1	FS	I-26 EB West of SC 453	B	17.5	C	21.6
DEB1	D	I-26 EB SC 453 Off-Ramp	C	21.1	C	25.8
FSEB2	FS	I-26 EB at SC 453	B	15.9	C	20.3
MEB1	M	I-26 EB SC 453 On-Ramp	C	20.6	C	25.0
FSEB3	FS	I-26 EB Between SC 453 and SC 27	B	17.4	C	22.2
DEB2	D	I-26 EB SC 27 Off-Ramp	B	17.8	C	20.9
FSEB4	FS	I-26 EB at SC 27	A	10.5	B	13.1
MEB2	M	I-26 EB SC 27 On-Ramp	B	17.1	B	19.7
FSEB5	FS	I-26 EB Between SC 27 and Volvo	B	14.3	B	16.8
DEB3	D	I-26 EB Volvo Off-Ramp	B	12.6	B	15.1
FSEB6	FS	I-26 EB at Volvo	B	13.3	B	16.3
MEB3	M	I-26 EB Volvo On-Ramp	A	0.0	A	0.0
FSEB7	FS	I-26 EB Between Volvo & Jedburg	B	16.1	C	20.0
DEB4	D	I-26 EB Jedburg Off-Ramp	C	23.7	C	27.4
FSEB8	FS	I-26 EB at Jedburg	B	15.0	C	18.8
MEB4	M	I-26 EB Jedburg On-Ramp	C	24.0	C	25.0
FSEB9	FS	I-26 EB East of Jedburg	C	23.1	C	25.2
FSWB1	FS	I-26 WB East of Jedburg	C	23.2	D	31.9
DWB1	D	I-26 WB Jedburg Off-Ramp	D	29.4	E	35.5
FSWB2	FS	I-26 WB At Jedburg	C	20.9	D	27.9
DWB1.1	---	I-26 WB Jedburg Loop Off-Ramp	C	22.4	C	27.6
FSWB2.1	---	I-26 WB west of Loop Off-Ramp	C	18.2	C	21.7
MWB1	M	I-26 WB Jedburg On-Ramp	B	16.7	B	19.4
FSWB3	FS	I-26 WB Between Jedburg and Volvo	C	19.4	C	23.1
DWB2	D	I-26 WB Volvo Off-Ramp	A	0.0	A	0.0
FSWB4	FS	I-26 WB At Volvo	B	15.0	C	20.7
MWB2	M	I-26 WB Volvo On-Ramp	B	13.4	B	19.1
FSWB5	FS	I-26 WB Between Volvo and SC 27	B	15.7	C	21.7
DWB3	D	I-26 WB SC 27 Off-Ramp	C	23.4	D	29.0



I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

Capacity Analysis

June 2019

Table 29 – 2043 Build Alternative 4 LOS Analysis Results (cont.)

Analysis Item			AM		PM	
			LOS	Density/ PFFS/ Delay	LOS	Density/ PFFS/ Delay
No.	Type	Description				
FSWB6	FS	I-26 WB at SC 27	B	12.9	B	17.4
MWB3	M	I-26 WB SC 27 On-Ramp	B	15.0	B	19.9
FSWB7	FS	I-26 WB Between SC 27 and SC 453	C	21.6	D	33.0
DWB4	D	I-26 WB SC 453 Off-Ramp	C	26.6	E	35.4
FSWB8	FS	I-26 WB at SC 453	C	19.7	D	29.9
MWB4	M	I-26 WB SC 453 On-Ramp	C	23.4	D	31.5
FSWB9	FS	I-26 WB West of SC 453	C	21.3	D	31.6
Two-Lane Highway Section (Percent Free-Flow Speed – %)						
TLNB1	III	Jedburg Road North of I-26 (NB)	D	74.3%	D	71.9%
TLSB1	III	Jedburg Road North of I-26 (SB)	D	72.0%	D	73.5%
TLNB2	III	Jedburg Road South of I-26 (NB)	E	65.8%	E	60.9%
TLSB2	III	Jedburg Road South of I-26 (SB)	E	66.7%	E	60.8%
TLNB3	III	Volvo Car Drive (NB)	D	71.7%	C	77.7%
TLSB3	III	Volvo Car Drive (SB)	D	71.8%	C	76.7%
TLNB4	III	SC 27 North of I-26 (NB)	D	74.7%	D	70.0%
TLSB4	III	SC 27 North of I-26 (SB)	C	75.1%	D	69.0%
TLNB5	III	SC 27 South of I-26 (NB)	D	74.2%	D	74.9%
TLSB5	III	SC 27 South of I-26 (SB)	C	75.7%	D	74.0%
TLNB6	III	SC 453 North of I-26 (NB)	C	81.1%	C	82.0%
TLSB6	III	SC 453 North of I-26 (SB)	C	82.5%	C	81.5%
TLNB7	III	SC 453 South of I-26 (NB)	C	80.1%	C	80.4%
TLSB7	III	SC 453 South of I-26 (SB)	C	80.7%	C	78.8%
Intersection (Delay – sec/veh)						
1	TWSC	Jedburg Road & Old Diary Road	F	> 300 (EB)	F	> 300 (EB)
2	SIGNAL	Jedburg Road & I-26 EB Ramps	C	34.1	B	11.2
3	SIGNAL	Jedburg Road & I-26 WB Ramps	A	2.5	A	2.6
4	TWSC	Jedburg Road & Drop Off Drive	F	52.0 (WB)	F	109.4 (WB)
5	TWSC	SC 27 & Emma Lane	C	17.9 (WB)	C	22.2 (WB)
6	TWSC	SC 27 & Miles Lane	C	16.3 (EB)	C	23.9 (EB)
7	RBT	SC 27 & I-26 WB Ramps	A	8.8	B	10.4



I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

Capacity Analysis

June 2019

Table 29 – 2043 Build Alternative 4 LOS Analysis Results (cont.)

Analysis Item			AM		PM	
			LOS	Density/ PFFS/ Delay	LOS	Density/ PFFS/ Delay
No.	Type	Description				
8	RBT	SC 27 & I-26 EB Ramps	A	7.0	A	8.2
9	TWSC	SC 27 & Interstate Drive	A	0.0 (EB)	D	25.2 (EB)
10	TWSC	SC 27 & Jared Lane	B	13.2 (WB)	C	15.7 (WB)
11	TWSC	SC 453 & 7 Mile Road	B	13.5 (WB)	C	17.6 (WB)
12	TWSC	SC 453 & I-26 WB Ramps	B	13.2 (WB)	B	14.5 (WB)
13	TWSC	SC 453 & I-26 EB Ramps	B	13.8 (EB)	B	14.3 (EB)
14	TWSC	SC 453 & US 178	C	15.7 (SB)	C	20.6 (SB)
15	SIGNAL	Volvo Car Drive & Factory Entrance	C	22.0	C	21.8

The results of the 2043 Build Alternative 4 LOS analysis indicate that all interstate sections, are anticipated to operate at acceptable levels of service in the design year, with two exceptions:

- I-26 WB Diverge to Jedburg Road; and
- I-26 WB Diverge to SC 453.

Additionally, all study area intersections are anticipated to operate at acceptable levels of service in both peak hours in the design year, with two exceptions:

- Jedburg Road & Old Dairy Road; and
- Jedburg Road & Drop Off Drive.

Additionally, all segments of two-lane Class III highway are anticipated to operate at acceptable levels of service in the design year, with one exception:

- Jedburg Road South of I-26.



6.5 SUMMARY

The capacity analysis results indicate that while the mainline of I-26 currently operates and is anticipated to continue to operate at acceptable levels of service through at least 2023, it is projected to experience undesirable, and in some areas, failing levels of service in the design year (2043) without any improvements. The widening of I-26 from four to six lanes mitigates these undesirable design year levels of service in all but two locations in the westbound direction (Diverges at Jedburg Road and at SC 453), which are projected to experience undesirable LOS E in 2043. However, the projected densities at these locations (35.5 pc/mi/ln and 35.4 pc/mi/ln, respectively) are both very close to the LOS E threshold of 35 pc/mi/ln and are also equivalent to the projected density and LOS in the No-Build conditions. Therefore, since the interchange improvements proposed with this project are limited to the I-26 & SC 27 interchange, and since the improvements (for any of the four alternatives) proposed at this interchange do not degrade the undesirable LOS at the two aforementioned locations such that they are worse than the No-Build conditions, no additional improvements to mitigate these levels of service are recommended in conjunction with this project.

Concerning the improvements to the I-26 & SC 27 interchange, the results of the capacity analysis for each of the four build alternatives indicate that each of the alternatives enhances the operation of the interchange such that acceptable levels of service are anticipated in both the opening (2023) and design year (2043).



7.0 CONCLUSIONS AND RECOMMENDATIONS

The South Carolina Department of Transportation (SCDOT) proposes to widen the segment of I-26 in Berkeley and Dorchester Counties between mile markers 187 and 194, adding one lane in each direction, while also making improvements to the I-26 & SC 27 interchange (Exit 187). This report summarizes the result of the traffic analysis performed for the I-26 widening and I-26 & SC 27 interchange improvements.

Per the language in the May 22nd, 2017 update of the Federal Highway Administration's (FHWA) Policy on Access to the Interstate System, the project study area includes the segment of I-26 located between mile marker (MM) 194 and 177 and includes the following interchanges:

Exit 194 – Jedburg Road (*improvements scheduled for construction*);
Exit 189 – Volvo Car Drive (*under construction*);
Exit 187 – SC 27 (*project interchange with proposed improvements*); and
Exit 177 – SC 453.

The traffic analysis includes a historical collision analysis for the past three years as well as AM and PM peak hour Highway Capacity Manual (HCM, 2010) analysis methodologies for analyzing interstate basic freeway segments, merges and diverges, as well as project intersections and two-lane highways capacity at the four cross-streets in the study area. The analysis includes 2018 Existing Conditions, 2023 (opening year) No-Build and Build Conditions, and 2043 (horizon year) No Build and Build Conditions. Four Build Condition alternatives were analyzed. Each of the build alternatives include the widening of I-26 between mile markers 194 and 187, with the differences between each alternative being the interchange type for improvements at the I-26 & SC 27 interchange:

Alternative 1: Traditional Diamond Interchange;
Alternative 2: Partial Cloverleaf Interchange (Parclo-B);
Alternative 3: Diamond with Single Loop Ramp; and
Alternative 4: Diamond Interchange with Roundabout Ramp Termini.

The project study area experienced 643 collisions over the past three years. Of the total collisions, the most frequently occurring type of collision were “no collision with motor vehicle” at a total of 287. The second most frequently occurring type of collision was rear end, followed by sideswipe, angle, head on, and backed into, in that order. I-26 within the study area experienced “no collision with motor vehicle” as the most frequently occurring type of collision. However, there were a particularly high number of rear end collisions at Jedburg Road along I-26. SC 27 and SC 453 experienced angle collisions as the most frequently occurring type of collision. In addition, at the I-26 & SC 27 interchange, there were a notable number of angle collisions at the intersection of SC 27 & I-26 westbound ramps. This could be due in part to sight distance at the intersection.

Of the 643 collisions, there were a total of 15 fatal crashes resulting in 17 fatalities, 163 collisions resulting in an injury, and 465 collisions which caused property damage only. Of the 15 fatal crashes, 14 occurred along I-26. Of these 14 fatal crashes, 10 involved drivers hitting trees resulting in fatal injuries – 4 hitting



I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

Conclusions and Recommendations

June 2019

tree(s) outside the right shoulder, 5 hitting tree(s) in the median which remain uncleared, and 1 hitting tree(s) in the median in an area which has since been cleared of trees. While not enough information is available to examine the clear-zone in the cases of each of the 4 tree-related collisions outside the right shoulder, it is recommended that clear-zone distances be reviewed as part of this I-26 widening project, as there may be an opportunity to lower the likelihood of fatal collision in run-off-the-road collision events. Also, given that over one-third (5 collisions) of the fatal collisions along I-26 in the last three years involved trees in uncleared sections of the median, another potential opportunity to lower the likelihood of fatal injuries may include additional tree-clearing in the median along I-26 in areas which were not part of the previous median tree-clearing effort.

Existing traffic volumes along the I-26 corridor and at ramp terminal and other adjacent intersections in the project area were collected and used to project future demand volumes based on anticipated growth in the area as forecasted by the Charleston Area Transportation Study (CHATS) travel demand model as well as additionally anticipated developments in the area. These volumes were used in the existing and future condition capacity analysis.

The capacity analysis results indicate that while the mainline of I-26 currently operates and is anticipated to continue to operate at acceptable levels of service through at least 2023, it is projected to experience undesirable, and in some areas, failing levels of service in the design year (2043) without any improvements.

The widening of I-26 from four to six lanes mitigates these undesirable design year levels of service in all but two locations in the westbound direction (Diverges at Jedburg Road and at SC 453), which are projected to experience undesirable LOS E in 2043. However, the projected densities at these locations (35.5 pc/mi/ln and 35.4 pc/mi/ln, respectively) are both very close to the LOS E threshold of 35 pc/mi/ln and are also equivalent to the projected density and LOS in the No-Build conditions. Therefore, since the interchange improvements proposed with this project are limited to the I-26 & SC 27 interchange, and since the improvements (for any of the four alternatives) proposed at this interchange do not degrade the undesirable LOS at the two aforementioned locations such that they are worse than the No-Build conditions, no additional improvements to mitigate these levels of service are recommended in conjunction with this project.

Concerning the improvements to the I-26 & SC 27 interchange, the results of the capacity analysis for each of the four build alternatives indicate that each of the alternatives enhances the operation of the interchange such that acceptable levels of service are anticipated in both the opening (2023) and design year (2043).



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Appendix A TRAFFIC VOLUME EXHIBITS

A.1 INTERSECTION DEVELOPMENT WORKSHEETS



INTERSECTION TRAFFIC VOLUME DEVELOPMENT

Jedburg Road & Old Dairy Road

TRAFFIC CONTROL: Unsignalized

DATE COUNTED: May 9, 2018

AM PEAK HOUR (8:00-9:00 AM)	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
2018 TRAFFIC VOLUMES	61	3	34	8	6	64	28	527	18	82	320	61
2018 BALANCED VOLUMES	79	3	34	8	6	82	28	677	18	116	455	87
Years To Opening (2023)	5	5	5	5	5	5	5	5	5	5	5	5
Yearly Growth Rate	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%
Background Traffic Growth	6	0	3	1	0	6	2	51	1	9	34	7
2023 TRAFFIC VOLUMES	85	3	37	9	6	88	30	728	19	125	489	94
2023 BALANCED TRAFFIC VOLUMES	85	3	37	9	6	88	30	728	19	125	489	94
Years To Buildout (2043)	25	25	25	25	25	25	25	25	25	25	25	25
Yearly Growth Rate	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%
Background Traffic Growth	30	1	13	3	2	31	11	254	7	44	171	33
2043 TRAFFIC VOLUMES	109	4	47	11	8	113	39	931	25	160	626	120
2043 VESTED TRUCK VOLUMES	109	4	47	11	8	113	39	930	25	160	625	120
2043 BALANCED TRAFFIC VOLUMES	109	4	47	11	8	113	39	930	25	160	625	120

PM PEAK HOUR (4:00-5:00 PM)	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
2018 TRAFFIC VOLUMES	65	7	52	10	10	152	27	599	22	87	644	96
2018 BALANCED VOLUMES	64	7	52	10	10	149	27	589	22	96	715	107
Years To Opening (2023)	5	5	5	5	5	5	5	5	5	5	5	5
Yearly Growth Rate	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%
Background Traffic Growth	5	1	4	1	1	11	2	44	2	7	54	8
2023 TRAFFIC VOLUMES	69	8	56	11	11	160	29	633	24	103	769	115
2023 BALANCED TRAFFIC VOLUMES	69	8	56	11	11	160	29	633	24	103	769	115
Years To Buildout (2043)	25	25	25	25	25	25	25	25	25	25	25	25
Yearly Growth Rate	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%
Background Traffic Growth	24	3	20	4	4	56	10	221	8	36	268	40
2043 TRAFFIC VOLUMES	88	10	72	14	14	205	37	810	30	132	983	147
2043 VESTED TRUCK VOLUMES	88	10	72	14	14	205	37	810	30	132	983	147
2043 BALANCED TRAFFIC VOLUMES	88	10	72	14	14	205	37	810	30	132	983	147

INTERSECTION TRAFFIC VOLUME DEVELOPMENT

I-26 Eastbound On/Off Ramps & Jedburg Road

TRAFFIC CONTROL: Signalized

DATE COUNTED: May 9, 2018

AM PEAK HOUR (7:00 - 8:00 AM)	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
2018 TRAFFIC VOLUMES	19	0	114	0	0	0	0	275	545	259	544	0
2018 BALANCED VOLUMES	20	0	114	0	0	0	0	293	545	259	544	0
Years To Opening (2023)	5	5	5	5	5	5	5	5	5	5	5	5
Yearly Growth Rate	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%
Background Traffic Growth	2	0	9	0	0	0	0	22	41	19	41	0
2023 TRAFFIC VOLUMES	22	0	123	0	0	0	0	315	586	278	585	0
2023 BALANCED TRAFFIC VOLUMES	22	0	123	0	0	0	0	315	586	278	585	0
Years To Buildout (2043)	25	25	25	25	25	25	25	25	25	25	25	25
Yearly Growth Rate	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%
Background Traffic Growth	8	0	43	0	0	0	0	110	204	97	204	0
2043 TRAFFIC VOLUMES	28	0	157	0	0	0	0	403	749	356	748	0
2043 VESTED TRUCK VOLUMES	28	0	157	0	0	0	0	403	749	356	748	0
2043 BALANCED TRAFFIC VOLUMES	28	0	157	0	0	0	0	403	749	356	748	0

PM PEAK HOUR (4:45-5:45 PM)	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
2018 TRAFFIC VOLUMES	53	2	91	0	0	0	0	337	456	136	797	0
2018 BALANCED VOLUMES	54	2	91	0	0	0	0	346	456	141	827	0
Years To Opening (2023)	5	5	5	5	5	5	5	5	5	5	5	5
Yearly Growth Rate	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%
Background Traffic Growth	4	0	7	0	0	0	0	26	34	11	62	0
2023 TRAFFIC VOLUMES	58	2	98	0	0	0	0	372	490	152	889	0
2023 BALANCED TRAFFIC VOLUMES	58	2	98	0	0	0	0	372	490	152	889	0
Years To Buildout (2043)	25	25	25	25	25	25	25	25	25	25	25	25
Yearly Growth Rate	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%
Background Traffic Growth	20	1	34	0	0	0	0	130	171	53	310	0
2043 TRAFFIC VOLUMES	74	3	125	0	0	0	0	476	627	194	1,137	0
2043 VESTED TRUCK VOLUMES	74	3	125	0	0	0	0	476	627	194	1,137	0
2043 BALANCED TRAFFIC VOLUMES	74	3	125	0	0	0	0	476	627	194	1,137	0

INTERSECTION TRAFFIC VOLUME DEVELOPMENT

I-26 Westbound On/Off Ramps & Jedburg Road

TRAFFIC CONTROL: Signalized

DATE COUNTED: May 9, 2018

AM PEAK HOUR (7:00-8:00 AM)	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
2018 TRAFFIC VOLUMES	0	0	0	291	0	141	61	252	0	0	503	79
2018 BALANCED VOLUMES	0	0	0	294	0	141	61	252	0	0	509	79
Years To Opening (2023)	5	5	5	5	5	5	5	5	5	5	5	5
Yearly Growth Rate	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%
Background Traffic Growth	0	0	0	22	0	11	5	19	0	0	38	6
2023 TRAFFIC VOLUMES	0	0	0	316	0	152	66	271	0	0	547	85
2023 BALANCED TRAFFIC VOLUMES	0	0	0	316	0	152	66	271	0	0	547	85
Years To Buildout (2043)	25	25	25	25	25	25	25	25	25	25	25	25
Yearly Growth Rate	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%
Background Traffic Growth	0	0	0	110	0	53	23	95	0	0	191	30
2043 TRAFFIC VOLUMES	0	0	0	404	0	194	84	347	0	0	700	109
2043 VESTED TRUCK VOLUMES	0	0	0	404	0	194	84	347	0	0	700	109
2043 BALANCED TRAFFIC VOLUMES	0	0	0	404	0	194	84	347	0	0	700	109

PM PEAK HOUR (5:00-6:00 PM)	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
2018 TRAFFIC VOLUMES	0	0	0	590	0	258	78	322	0	0	355	60
2018 BALANCED VOLUMES	0	0	0	583	0	258	78	322	0	0	385	66
Years To Opening (2023)	5	5	5	5	5	5	5	5	5	5	5	5
Yearly Growth Rate	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%
Background Traffic Growth	0	0	0	44	0	19	6	24	0	0	29	5
2023 TRAFFIC VOLUMES	0	0	0	627	0	277	84	346	0	0	414	71
2023 BALANCED TRAFFIC VOLUMES	0	0	0	627	0	277	84	346	0	0	414	71
Years To Buildout (2043)	25	25	25	25	25	25	25	25	25	25	25	25
Yearly Growth Rate	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%
Background Traffic Growth	0	0	0	219	0	97	29	121	0	0	144	25
2043 TRAFFIC VOLUMES	0	0	0	802	0	355	107	443	0	0	529	91
2043 VESTED TRUCK VOLUMES	0	0	0	802	0	355	107	443	0	0	529	91
2043 BALANCED TRAFFIC VOLUMES	0	0	0	802	0	355	107	443	0	0	529	91

INTERSECTION TRAFFIC VOLUME DEVELOPMENT

Jedburg Road & Drop-Off Drive

TRAFFIC CONTROL: Unsignalized

DATE COUNTED: May 9, 2018

AM PEAK HOUR (8:00-9:00 AM)	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
2018 TRAFFIC VOLUMES	31	8	61	38	13	13	41	227	47	17	317	51
2018 BALANCED VOLUMES	31	8	87	46	13	13	51	283	59	17	455	51
Years To Opening (2023)	5	5	5	5	5	5	5	5	5	5	5	5
Yearly Growth Rate	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%
Background Traffic Growth	2	1	7	3	1	1	4	21	4	1	34	4
2023 TRAFFIC VOLUMES	33	9	94	49	14	14	55	304	63	18	489	55
2023 BALANCED TRAFFIC VOLUMES	33	9	94	49	14	14	55	305	63	18	489	55
Years To Buildout (2043)	25	25	25	25	25	25	25	25	25	25	25	25
Yearly Growth Rate	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%
Background Traffic Growth	12	3	33	17	5	5	19	106	22	6	171	19
2043 TRAFFIC VOLUMES	43	11	120	63	18	18	70	389	81	23	626	70
2043 VESTED TRUCK VOLUMES	43	11	120	63	18	18	70	390	81	23	626	70
2043 BALANCED TRAFFIC VOLUMES	43	11	120	63	18	18	70	390	81	23	626	70

PM PEAK HOUR (4:00-5:00 PM)	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
2018 TRAFFIC VOLUMES	26	7	76	64	7	24	63	452	40	13	311	55
2018 BALANCED VOLUMES	26	7	76	64	7	24	66	472	42	13	311	55
Years To Opening (2023)	5	5	5	5	5	5	5	5	5	5	5	5
Yearly Growth Rate	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%
Background Traffic Growth	2	1	6	5	1	2	5	35	3	1	23	4
2023 TRAFFIC VOLUMES	28	8	82	69	8	26	71	507	45	14	334	59
2023 BALANCED TRAFFIC VOLUMES	28	8	82	69	8	26	71	507	45	14	334	59
Years To Buildout (2043)	25	25	25	25	25	25	25	25	25	25	25	25
Yearly Growth Rate	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%
Background Traffic Growth	10	3	29	24	3	9	25	177	16	5	117	21
2043 TRAFFIC VOLUMES	36	10	105	88	10	33	91	649	58	18	428	76
2043 VESTED TRUCK VOLUMES	36	10	105	88	10	33	91	649	58	18	427	76
2043 BALANCED TRAFFIC VOLUMES	36	10	105	88	10	33	91	649	58	18	427	76

INTERSECTION TRAFFIC VOLUME DEVELOPMENT

SC 27/Ridgeville Road & Emma Lane

TRAFFIC CONTROL: Unsignalized

DATE COUNTED: May 9, 2018

AM PEAK HOUR (7:00-8:00 AM)	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
2018 TRAFFIC VOLUMES	0	0	0	2	0	0	0	384	1	0	355	0
2018 BALANCED VOLUMES	0	0	0	2	0	0	0	382	1	0	348	0
Years To Opening (2023)	5	5	5	5	5	5	5	5	5	5	5	5
Yearly Growth Rate	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%
Background Traffic Growth	0	0	0	0	0	0	0	33	0	0	30	0
2023 TRAFFIC VOLUMES	0	0	0	2	0	0	0	415	1	0	378	0
2023 BALANCED TRAFFIC VOLUMES	0	0	0	2	0	0	0	415	1	0	379	0
Years To Buildout (2043)	25	25	25	25	25	25	25	25	25	25	25	25
Yearly Growth Rate	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%
Background Traffic Growth	0	0	0	1	0	0	0	167	0	0	152	0
2043 TRAFFIC VOLUMES	0	0	0	3	0	0	0	549	1	0	500	0
2043 VESTED TRUCK VOLUMES	0	0	0	3	0	0	0	549	1	0	500	0
2043 BALANCED TRAFFIC VOLUMES	0	0	0	3	0	0	0	549	1	0	500	0

PM PEAK HOUR (5:00-6:00 PM)	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
2018 TRAFFIC VOLUMES	0	0	0	5	0	1	0	395	3	2	519	0
2018 BALANCED VOLUMES	0	0	0	6	0	1	0	415	4	2	533	0
Years To Opening (2023)	5	5	5	5	5	5	5	5	5	5	5	5
Yearly Growth Rate	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%
Background Traffic Growth	0	0	0	1	0	0	0	36	0	0	47	0
2023 TRAFFIC VOLUMES	0	0	0	7	0	1	0	451	4	2	580	0
2023 BALANCED TRAFFIC VOLUMES	0	0	0	7	0	1	0	451	4	2	579	0
Years To Buildout (2043)	25	25	25	25	25	25	25	25	25	25	25	25
Yearly Growth Rate	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%
Background Traffic Growth	0	0	0	3	0	0	0	182	2	1	233	0
2043 TRAFFIC VOLUMES	0	0	0	9	0	1	0	597	6	3	766	0
2043 VESTED TRUCK VOLUMES	0	0	0	9	0	1	0	596	6	3	766	0
2043 BALANCED TRAFFIC VOLUMES	0	0	0	9	0	1	0	596	6	3	766	0

INTERSECTION TRAFFIC VOLUME DEVELOPMENT

SC 27/Ridgeville Road & Miles Lane

TRAFFIC CONTROL: Unsignalized

DATE COUNTED: May 9, 2018

AM PEAK HOUR (7:00-8:00 AM)	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
2018 TRAFFIC VOLUMES	1	0	1	0	0	0	0	382	0	0	347	3
2018 BALANCED VOLUMES	1	0	1	0	0	0	0	382	0	0	347	3
Years To Opening (2023)	5	5	5	5	5	5	5	5	5	5	5	5
Yearly Growth Rate	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%
Background Traffic Growth	0	0	0	0	0	0	0	33	0	0	30	0
2023 TRAFFIC VOLUMES	1	0	1	0	0	0	0	415	0	0	377	3
2023 BALANCED TRAFFIC VOLUMES	1	0	1	0	0	0	0	415	0	0	378	3
Years To Buildout (2043)	25	25	25	25	25	25	25	25	25	25	25	25
Yearly Growth Rate	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%
Background Traffic Growth	0	0	0	0	0	0	0	167	0	0	152	1
2043 TRAFFIC VOLUMES	1	0	1	0	0	0	0	549	0	0	499	4
2043 VESTED TRUCK VOLUMES	1	0	1	0	0	0	0	549	0	0	499	4
2043 BALANCED TRAFFIC VOLUMES	1	0	1	0	0	0	0	549	0	0	499	4

PM PEAK HOUR (5:00-6:00 PM)	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
2018 TRAFFIC VOLUMES	1	0	1	0	0	0	0	396	0	0	510	2
2018 BALANCED VOLUMES	1	0	1	0	0	0	0	418	0	0	537	2
Years To Opening (2023)	5	5	5	5	5	5	5	5	5	5	5	5
Yearly Growth Rate	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%
Background Traffic Growth	0	0	0	0	0	0	0	37	0	0	47	0
2023 TRAFFIC VOLUMES	1	0	1	0	0	0	0	455	0	0	584	2
2023 BALANCED TRAFFIC VOLUMES	1	0	1	0	0	0	0	454	0	0	584	2
Years To Buildout (2043)	25	25	25	25	25	25	25	25	25	25	25	25
Yearly Growth Rate	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%
Background Traffic Growth	0	0	0	0	0	0	0	183	0	0	235	1
2043 TRAFFIC VOLUMES	1	0	1	0	0	0	0	601	0	0	772	3
2043 VESTED TRUCK VOLUMES	1	0	1	0	0	0	0	601	0	0	772	3
2043 BALANCED TRAFFIC VOLUMES	1	0	1	0	0	0	0	601	0	0	772	3

INTERSECTION TRAFFIC VOLUME DEVELOPMENT

1-26 Westbound On/Off Ramps & SC 27/Ridgeville Road

TRAFFIC CONTROL: Unsignalized

DATE COUNTED: May 9, 2018

AM PEAK HOUR (8:00-9:00 AM)	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
2018 TRAFFIC VOLUMES	0	0	0	116	2	96	54	101	0	0	250	14
2018 BALANCED VOLUMES	0	0	0	158	2	186	87	196	0	0	330	18
Years To Opening (2023)	5	5	5	5	5	5	5	5	5	5	5	5
Yearly Growth Rate	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%
Background Traffic Growth	0	0	0	14	0	16	8	17	0	0	29	2
2023 TRAFFIC VOLUMES	0	0	0	172	2	202	95	213	0	0	359	20
2023 BALANCED TRAFFIC VOLUMES	0	0	0	172	2	202	95	213	0	0	359	20
Years To Buildout (2043)	25	25	25	25	25	25	25	25	25	25	25	25
Yearly Growth Rate	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%
Background Traffic Growth	0	0	0	69	1	81	38	86	0	0	144	8
2043 TRAFFIC VOLUMES	0	0	0	227	3	267	125	282	0	0	474	26
2043 VESTED TRUCK VOLUMES	0	0	0	244	3	267	138	282	0	0	474	26
2043 BALANCED TRAFFIC VOLUMES	0	0	0	244	3	267	138	282	0	0	474	26

PM PEAK HOUR (4:00-5:00 PM)	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
2018 TRAFFIC VOLUMES	0	0	0	201	2	264	76	143	0	0	478	58
2018 BALANCED VOLUMES	0	0	0	201	2	264	83	154	0	0	480	58
Years To Opening (2023)	5	5	5	5	5	5	5	5	5	5	5	5
Yearly Growth Rate	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%
Background Traffic Growth	0	0	0	18	0	23	7	13	0	0	42	5
2023 TRAFFIC VOLUMES	0	0	0	219	2	287	90	167	0	0	522	63
2023 BALANCED TRAFFIC VOLUMES	0	0	0	219	2	287	90	167	0	0	522	63
Years To Buildout (2043)	25	25	25	25	25	25	25	25	25	25	25	25
Yearly Growth Rate	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%
Background Traffic Growth	0	0	0	88	1	116	36	67	0	0	210	25
2043 TRAFFIC VOLUMES	0	0	0	289	3	380	119	221	0	0	690	83
2043 VESTED TRUCK VOLUMES	0	0	0	306	3	380	132	221	0	0	690	83
2043 BALANCED TRAFFIC VOLUMES	0	0	0	306	3	380	132	221	0	0	690	83

INTERSECTION TRAFFIC VOLUME DEVELOPMENT

I-26 Eastbound On/Off Ramp & SC 27/Ridgeville Road

TRAFFIC CONTROL: Unsignalized

DATE COUNTED: May 9, 2018

AM PEAK HOUR (8:00-9:00 AM)	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
2018 TRAFFIC VOLUMES	22	0	57	0	0	0	0	148	163	171	193	0
2018 BALANCED VOLUMES	33	0	76	0	0	0	0	250	237	229	259	0
Years To Opening (2023)	5	5	5	5	5	5	5	5	5	5	5	5
Yearly Growth Rate	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%
Background Traffic Growth	3	0	7	0	0	0	0	22	21	20	23	0
2023 TRAFFIC VOLUMES	36	0	83	0	0	0	0	272	258	249	282	0
2023 BALANCED TRAFFIC VOLUMES	36	0	83	0	0	0	0	272	258	249	282	0
Years To Buildout (2043)	25	25	25	25	25	25	25	25	25	25	25	25
Yearly Growth Rate	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%
Background Traffic Growth	14	0	33	0	0	0	0	109	104	100	113	0
2043 TRAFFIC VOLUMES	47	0	109	0	0	0	0	359	341	329	372	0
2043 VESTED TRUCK VOLUMES	47	0	122	0	0	0	0	373	358	329	389	0
2043 BALANCED TRAFFIC VOLUMES	47	0	122	0	0	0	0	373	358	329	389	0

PM PEAK HOUR (4:00-5:00 PM)	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
2018 TRAFFIC VOLUMES	21	0	101	0	0	0	0	200	157	316	365	0
2018 BALANCED VOLUMES	21	0	103	0	0	0	0	215	162	315	366	0
Years To Opening (2023)	5	5	5	5	5	5	5	5	5	5	5	5
Yearly Growth Rate	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%
Background Traffic Growth	2	0	9	0	0	0	0	19	14	28	32	0
2023 TRAFFIC VOLUMES	23	0	112	0	0	0	0	234	176	343	398	0
2023 BALANCED TRAFFIC VOLUMES	23	0	112	0	0	0	0	234	176	343	398	0
Years To Buildout (2043)	25	25	25	25	25	25	25	25	25	25	25	25
Yearly Growth Rate	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%
Background Traffic Growth	9	0	45	0	0	0	0	94	71	138	160	0
2043 TRAFFIC VOLUMES	30	0	148	0	0	0	0	309	233	453	526	0
2043 VESTED TRUCK VOLUMES	30	0	161	0	0	0	0	323	250	453	543	0
2043 BALANCED TRAFFIC VOLUMES	30	0	161	0	0	0	0	323	250	453	543	0

INTERSECTION TRAFFIC VOLUME DEVELOPMENT

SC 27/Ridgeville Road & Interstate Drive

TRAFFIC CONTROL: Unsignalized

DATE COUNTED: May 9, 2018

AM PEAK HOUR (7:00-8:00 AM)	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
2018 TRAFFIC VOLUMES	0	0	0	0	0	0	0	459	0	0	334	1
2018 BALANCED VOLUMES	0	0	0	0	0	0	0	487	0	0	334	1
Years To Opening (2023)	5	5	5	5	5	5	5	5	5	5	5	5
Yearly Growth Rate	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%
Background Traffic Growth	0	0	0	0	0	0	0	43	0	0	29	0
2023 TRAFFIC VOLUMES	0	0	0	0	0	0	0	530	0	0	363	1
2023 BALANCED TRAFFIC VOLUMES	0	0	0	0	0	0	0	530	0	0	364	1
Years To Buildout (2043)	25	25	25	25	25	25	25	25	25	25	25	25
Yearly Growth Rate	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%
Background Traffic Growth	0	0	0	0	0	0	0	213	0	0	146	0
2043 TRAFFIC VOLUMES	0	0	0	0	0	0	0	700	0	0	480	1
2043 VESTED TRUCK VOLUMES	0	0	0	0	0	0	0	731	0	0	510	1
2043 BALANCED TRAFFIC VOLUMES	0	0	0	0	0	0	0	731	0	0	510	1

PM PEAK HOUR (5:00-6:00 PM)	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
2018 TRAFFIC VOLUMES	1	0	0	0	0	0	1	376	0	0	468	1
2018 BALANCED VOLUMES	1	0	0	0	0	0	1	376	0	0	468	1
Years To Opening (2023)	5	5	5	5	5	5	5	5	5	5	5	5
Yearly Growth Rate	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%
Background Traffic Growth	0	0	0	0	0	0	0	33	0	0	41	0
2023 TRAFFIC VOLUMES	1	0	0	0	0	0	1	409	0	0	509	1
2023 BALANCED TRAFFIC VOLUMES	1	0	0	0	0	0	1	409	0	0	509	1
Years To Buildout (2043)	25	25	25	25	25	25	25	25	25	25	25	25
Yearly Growth Rate	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%
Background Traffic Growth	0	0	0	0	0	0	0	165	0	0	205	0
2043 TRAFFIC VOLUMES	1	0	0	0	0	0	1	541	0	0	673	1
2043 VESTED TRUCK VOLUMES	1	0	0	0	0	0	1	572	0	0	703	1
2043 BALANCED TRAFFIC VOLUMES	1	0	0	0	0	0	1	572	0	0	703	1

INTERSECTION TRAFFIC VOLUME DEVELOPMENT

SC 27/Ridgeville Road & Jared Lane

TRAFFIC CONTROL: Unsignalized

DATE COUNTED: May 9, 2018

AM PEAK HOUR (7:00-8:00 AM)	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
2018 TRAFFIC VOLUMES	0	0	0	1	1	3	0	415	1	1	339	0
2018 BALANCED VOLUMES	0	0	0	1	1	5	0	482	1	1	333	0
Years To Opening (2023)	5	5	5	5	5	5	5	5	5	5	5	5
Yearly Growth Rate	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%
Background Traffic Growth	0	0	0	0	0	0	0	42	0	0	29	0
2023 TRAFFIC VOLUMES	0	0	0	1	1	5	0	524	1	1	362	0
2023 BALANCED TRAFFIC VOLUMES	0	0	0	1	1	5	0	525	1	1	362	0
Years To Buildout (2043)	25	25	25	25	25	25	25	25	25	25	25	25
Yearly Growth Rate	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%
Background Traffic Growth	0	0	0	0	0	2	0	211	0	0	146	0
2043 TRAFFIC VOLUMES	0	0	0	1	1	7	0	693	1	1	479	0
2043 VESTED TRUCK VOLUMES	0	0	0	1	1	7	0	724	1	1	509	0
2043 BALANCED TRAFFIC VOLUMES	0	0	0	1	1	7	0	724	1	1	509	0

PM PEAK HOUR (5:00-6:00 PM)	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
2018 TRAFFIC VOLUMES	0	0	0	4	0	4	0	376	7	8	465	0
2018 BALANCED VOLUMES	0	0	0	4	0	4	0	373	7	8	460	0
Years To Opening (2023)	5	5	5	5	5	5	5	5	5	5	5	5
Yearly Growth Rate	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%
Background Traffic Growth	0	0	0	0	0	0	0	33	1	1	40	0
2023 TRAFFIC VOLUMES	0	0	0	4	0	4	0	406	8	9	500	0
2023 BALANCED TRAFFIC VOLUMES	0	0	0	4	0	4	0	406	8	9	500	0
Years To Buildout (2043)	25	25	25	25	25	25	25	25	25	25	25	25
Yearly Growth Rate	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%
Background Traffic Growth	0	0	0	2	0	2	0	163	3	4	201	0
2043 TRAFFIC VOLUMES	0	0	0	6	0	6	0	536	10	12	661	0
2043 VESTED TRUCK VOLUMES	0	0	0	6	0	6	0	567	10	12	691	0
2043 BALANCED TRAFFIC VOLUMES	0	0	0	6	0	6	0	567	10	12	691	0

INTERSECTION TRAFFIC VOLUME DEVELOPMENT

Judge Street & 7 Mile Road

TRAFFIC CONTROL: Unsignalized

DATE COUNTED: May 9, 2018

AM PEAK HOUR (7:00-8:00 AM)	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
2018 TRAFFIC VOLUMES	6	6	25	31	3	15	8	159	36	13	107	1
2018 BALANCED VOLUMES	6	6	25	31	3	15	8	165	37	13	107	1
Years To Opening (2023)	5	5	5	5	5	5	5	5	5	5	5	5
Yearly Growth Rate	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Background Traffic Growth	0	0	1	2	0	1	0	8	2	1	5	0
2023 TRAFFIC VOLUMES	6	6	26	33	3	16	8	173	39	14	112	1
2023 BALANCED TRAFFIC VOLUMES	6	6	26	33	3	16	8	174	39	14	112	1
Years To Buildout (2043)	25	25	25	25	25	25	25	25	25	25	25	25
Yearly Growth Rate	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Background Traffic Growth	2	2	6	8	1	4	2	41	9	3	27	0
2043 TRAFFIC VOLUMES	8	8	31	39	4	19	10	206	46	16	134	1
2043 VESTED TRUCK VOLUMES	8	8	31	39	4	19	10	207	46	16	134	1
2043 BALANCED TRAFFIC VOLUMES	8	8	31	39	4	19	10	207	46	16	134	1

PM PEAK HOUR (5:00-6:00 PM)	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
2018 TRAFFIC VOLUMES	6	2	22	101	9	17	20	125	29	17	142	12
2018 BALANCED VOLUMES	6	2	22	101	9	17	20	125	29	17	142	12
Years To Opening (2023)	5	5	5	5	5	5	5	5	5	5	5	5
Yearly Growth Rate	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Background Traffic Growth	0	0	1	5	0	1	1	6	1	1	7	1
2023 TRAFFIC VOLUMES	6	2	23	106	9	18	21	131	30	18	149	13
2023 BALANCED TRAFFIC VOLUMES	6	2	23	106	9	18	21	132	30	18	149	13
Years To Buildout (2043)	25	25	25	25	25	25	25	25	25	25	25	25
Yearly Growth Rate	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Background Traffic Growth	2	1	6	25	2	4	5	31	7	4	36	3
2043 TRAFFIC VOLUMES	8	3	28	126	11	21	25	156	36	21	178	15
2043 VESTED TRUCK VOLUMES	8	3	28	126	11	21	25	157	36	21	178	15
2043 BALANCED TRAFFIC VOLUMES	8	3	28	126	11	21	25	157	36	21	178	15

INTERSECTION TRAFFIC VOLUME DEVELOPMENT

I-26 Westbound On/Off Ramps and Judge Street

TRAFFIC CONTROL: Unsignalized

DATE COUNTED: May 9, 2018

AM PEAK HOUR (8:00-9:00 AM)	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
2018 TRAFFIC VOLUMES	0	0	0	57	2	67	24	78	0	0	137	24
2018 BALANCED VOLUMES	0	0	0	57	2	94	26	116	0	0	139	24
Years To Opening (2023)	5	5	5	5	5	5	5	5	5	5	5	5
Yearly Growth Rate	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Background Traffic Growth	0	0	0	3	0	5	1	6	0	0	7	1
2023 TRAFFIC VOLUMES	0	0	0	60	2	99	27	122	0	0	146	25
2023 BALANCED TRAFFIC VOLUMES	0	0	0	60	2	99	27	122	0	0	146	25
Years To Buildout (2043)	25	25	25	25	25	25	25	25	25	25	25	25
Yearly Growth Rate	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Background Traffic Growth	0	0	0	14	1	24	7	29	0	0	35	6
2043 TRAFFIC VOLUMES	0	0	0	71	3	118	33	145	0	0	174	30
2043 VESTED TRUCK VOLUMES	0	0	0	71	3	118	33	145	0	0	174	30
2043 BALANCED TRAFFIC VOLUMES	0	0	0	71	3	118	33	145	0	0	174	30

PM PEAK HOUR (4:00-5:00 PM)	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
2018 TRAFFIC VOLUMES	0	0	0	76	0	80	27	88	0	0	199	22
2018 BALANCED VOLUMES	0	0	0	76	0	82	27	92	0	0	237	28
Years To Opening (2023)	5	5	5	5	5	5	5	5	5	5	5	5
Yearly Growth Rate	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Background Traffic Growth	0	0	0	4	0	4	1	5	0	0	12	1
2023 TRAFFIC VOLUMES	0	0	0	80	0	86	28	97	0	0	249	29
2023 BALANCED TRAFFIC VOLUMES	0	0	0	80	0	86	28	97	0	0	249	29
Years To Buildout (2043)	25	25	25	25	25	25	25	25	25	25	25	25
Yearly Growth Rate	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Background Traffic Growth	0	0	0	19	0	21	7	23	0	0	59	7
2043 TRAFFIC VOLUMES	0	0	0	95	0	103	34	115	0	0	296	35
2043 VESTED TRUCK VOLUMES	0	0	0	95	0	103	34	115	0	0	297	35
2043 BALANCED TRAFFIC VOLUMES	0	0	0	95	0	103	34	115	0	0	297	35

INTERSECTION TRAFFIC VOLUME DEVELOPMENT

I-26 Eastbound On/Off Ramps & Judge Street

TRAFFIC CONTROL: Unsignalized

DATE COUNTED: May 9, 2018

AM PEAK HOUR (8:00-9:00 AM)	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
2018 TRAFFIC VOLUMES	27	2	24	0	0	0	0	115	66	64	118	0
2018 BALANCED VOLUMES	27	2	24	0	0	0	0	115	66	68	128	0
Years To Opening (2023)	5	5	5	5	5	5	5	5	5	5	5	5
Yearly Growth Rate	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Background Traffic Growth	1	0	1	0	0	0	0	6	3	3	6	0
2023 TRAFFIC VOLUMES	28	2	25	0	0	0	0	121	69	71	134	0
2023 BALANCED TRAFFIC VOLUMES	28	2	25	0	0	0	0	121	69	71	135	0
Years To Buildout (2043)	25	25	25	25	25	25	25	25	25	25	25	25
Yearly Growth Rate	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Background Traffic Growth	7	1	6	0	0	0	0	29	17	17	32	0
2043 TRAFFIC VOLUMES	34	3	30	0	0	0	0	144	83	85	160	0
2043 VESTED TRUCK VOLUMES	34	3	30	0	0	0	0	144	83	85	160	0
2043 BALANCED TRAFFIC VOLUMES	34	3	30	0	0	0	0	144	83	85	160	0

PM PEAK HOUR (4:00-5:00 PM)	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
2018 TRAFFIC VOLUMES	10	0	19	0	0	0	0	104	53	89	184	0
2018 BALANCED VOLUMES	10	0	19	0	0	0	0	109	53	102	211	0
Years To Opening (2023)	5	5	5	5	5	5	5	5	5	5	5	5
Yearly Growth Rate	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Background Traffic Growth	1	0	1	0	0	0	0	5	3	5	11	0
2023 TRAFFIC VOLUMES	11	0	20	0	0	0	0	114	56	107	222	0
2023 BALANCED TRAFFIC VOLUMES	11	0	20	0	0	0	0	114	56	107	222	0
Years To Buildout (2043)	25	25	25	25	25	25	25	25	25	25	25	25
Yearly Growth Rate	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Background Traffic Growth	3	0	5	0	0	0	0	27	13	26	53	0
2043 TRAFFIC VOLUMES	13	0	24	0	0	0	0	136	66	128	264	0
2043 VESTED TRUCK VOLUMES	13	0	24	0	0	0	0	136	66	128	264	0
2043 BALANCED TRAFFIC VOLUMES	13	0	24	0	0	0	0	136	66	128	264	0

INTERSECTION TRAFFIC VOLUME DEVELOPMENT

Judge Street & West Main Street

TRAFFIC CONTROL: Unsignalized

DATE COUNTED: May 9, 2018

AM PEAK HOUR (7:00-8:00 AM)	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
2018 TRAFFIC VOLUMES	52	80	0	0	53	93	0	0	0	80	0	33
2018 BALANCED VOLUMES	65	80	0	0	53	116	0	0	0	107	0	45
Years To Opening (2023)	5	5	5	5	5	5	5	5	5	5	5	5
Yearly Growth Rate	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Background Traffic Growth	3	4	0	0	3	6	0	0	0	5	0	2
2023 TRAFFIC VOLUMES	68	84	0	0	56	122	0	0	0	112	0	47
2023 BALANCED TRAFFIC VOLUMES	68	84	0	0	56	122	0	0	0	112	0	47
Years To Buildout (2043)	25	25	25	25	25	25	25	25	25	25	25	25
Yearly Growth Rate	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Background Traffic Growth	16	20	0	0	13	29	0	0	0	27	0	11
2043 TRAFFIC VOLUMES	81	100	0	0	66	145	0	0	0	134	0	56
2043 VESTED TRUCK VOLUMES	81	100	0	0	66	146	0	0	0	134	0	56
2043 BALANCED TRAFFIC VOLUMES	81	100	0	0	66	146	0	0	0	134	0	56

PM PEAK HOUR (5:00-6:00 PM)	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
2018 TRAFFIC VOLUMES	24	85	0	0	117	88	0	0	0	112	0	42
2018 BALANCED VOLUMES	34	85	0	0	117	128	0	0	0	167	0	63
Years To Opening (2023)	5	5	5	5	5	5	5	5	5	5	5	5
Yearly Growth Rate	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Background Traffic Growth	2	4	0	0	6	6	0	0	0	8	0	3
2023 TRAFFIC VOLUMES	36	89	0	0	123	134	0	0	0	175	0	66
2023 BALANCED TRAFFIC VOLUMES	36	89	0	0	123	134	0	0	0	176	0	67
Years To Buildout (2043)	25	25	25	25	25	25	25	25	25	25	25	25
Yearly Growth Rate	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Background Traffic Growth	9	21	0	0	29	32	0	0	0	42	0	16
2043 TRAFFIC VOLUMES	43	106	0	0	146	160	0	0	0	209	0	79
2043 VESTED TRUCK VOLUMES	43	106	0	0	146	159	0	0	0	209	0	79
2043 BALANCED TRAFFIC VOLUMES	43	106	0	0	146	159	0	0	0	209	0	79

INTERSECTION TRAFFIC VOLUME DEVELOPMENT

Volvo Car Drive & Factory Entrance/Welcome Center

TRAFFIC CONTROL: Signalized

DATE COUNTED: N/A

AM PEAK HOUR (7:00-8:00 AM)	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
2018 TRAFFIC VOLUMES	0	0	0	0	0	0	0	0	0	0	0	0
2018 BALANCED VOLUMES	0	0	0	0	0	0	0	0	0	0	0	0
Years To Opening (2023)	5	5	5	5	5	5	5	5	5	5	5	5
Yearly Growth Rate	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Background Traffic Growth	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2019 TRAFFIC VOLUMES*	3	0	10	22	0	10	70	182	203	67	71	24
2023 BALANCED TRAFFIC VOLUMES**	3	0	11	24	0	11	76	197	219	72	77	26
Years To Buildout (2043)	25	25	25	25	25	25	25	25	25	25	25	25
Yearly Growth Rate	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Background Traffic Growth	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2039 TRAFFIC VOLUMES*	4	0	12	149	0	50	90	742	28	10	418	30
2043 VESTED TRUCK VOLUMES	4	0	13	161	0	54	97	801	30	11	451	32
2043 BALANCED TRAFFIC VOLUMES**	4	0	13	161	0	54	97	801	30	11	451	32

PM PEAK HOUR (5:00-6:00 PM)	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
2018 TRAFFIC VOLUMES	0	0	0	0	0	0	0	0	0	0	0	0
2018 BALANCED VOLUMES	0	0	0	0	0	0	0	0	0	0	0	0
Years To Opening (2023)	5	5	5	5	5	5	5	5	5	5	5	5
Yearly Growth Rate	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Background Traffic Growth	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2019 TRAFFIC VOLUMES*	25	0	74	203	0	67	17	104	23	7	162	5
2023 BALANCED TRAFFIC VOLUMES**	27	0	79	219	0	72	18	112	25	8	174	5
Years To Buildout (2043)	25	25	25	25	25	25	25	25	25	25	25	25
Yearly Growth Rate	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Background Traffic Growth	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2039 TRAFFIC VOLUMES*	52	0	158	14	0	4	30	357	14	4	549	11
2043 VESTED TRUCK VOLUMES	56	0	171	15	0	4	32	386	15	4	593	12
2043 BALANCED TRAFFIC VOLUMES**	56	0	171	15	0	4	32	386	15	4	593	12

* 2019 volumes assume one volvo factory entrance, 2039 volumes assume two volvo factory entrances, with 50% volvo shift traffic assigned to each

** Grown up from 2019 and 2039 volumes from Volvo Car Drive IJR (at 2% growth rate according to the growth rate assumed in Volvo Car Drive IJR)


I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

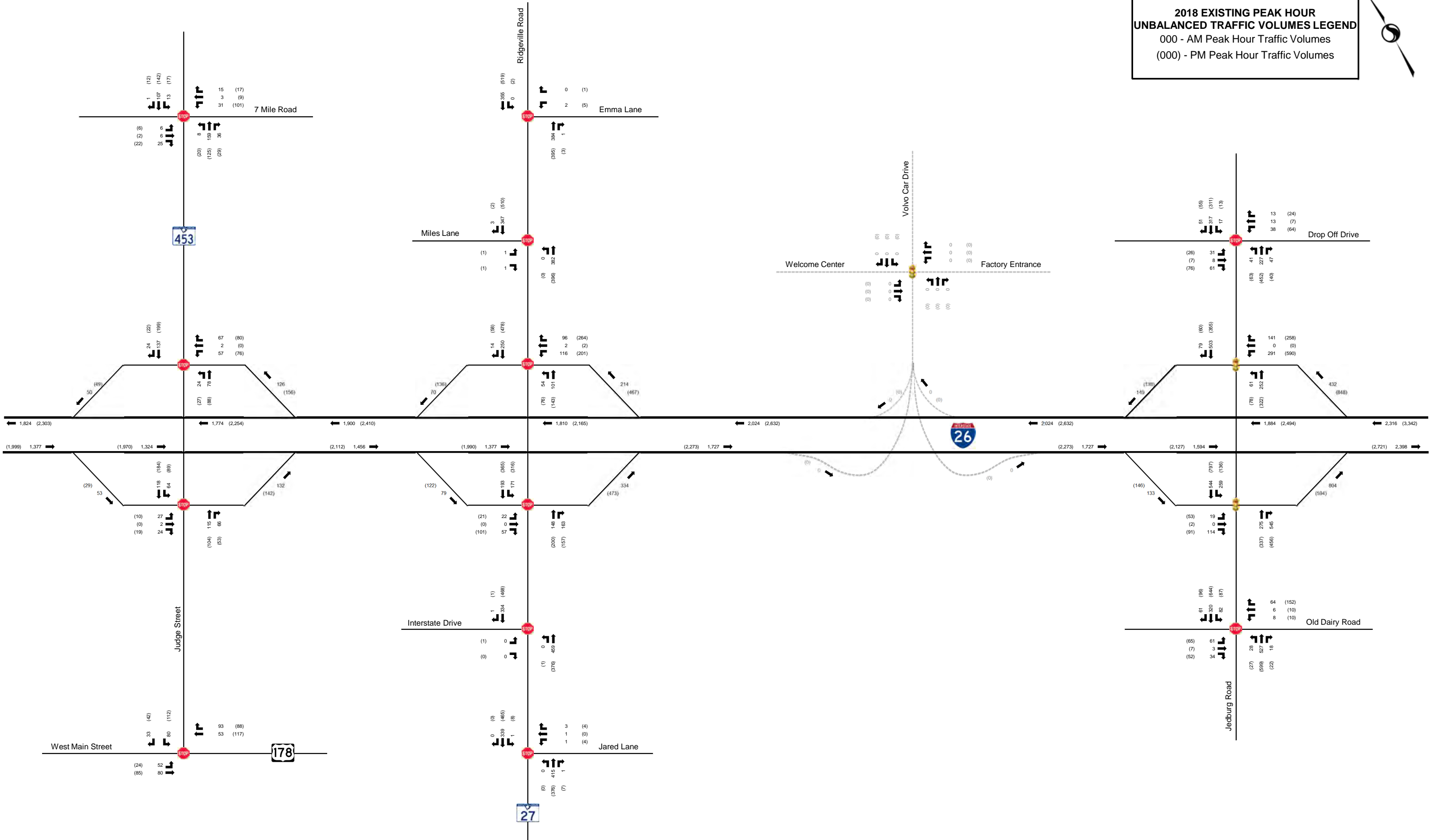
June 2019

A.2 2018 UNBALANCED



2018 EXISTING PEAK HOUR
UNBALANCED TRAFFIC VOLUMES LEGEND
000 - AM Peak Hour Traffic Volumes
(000) - PM Peak Hour Traffic Volumes



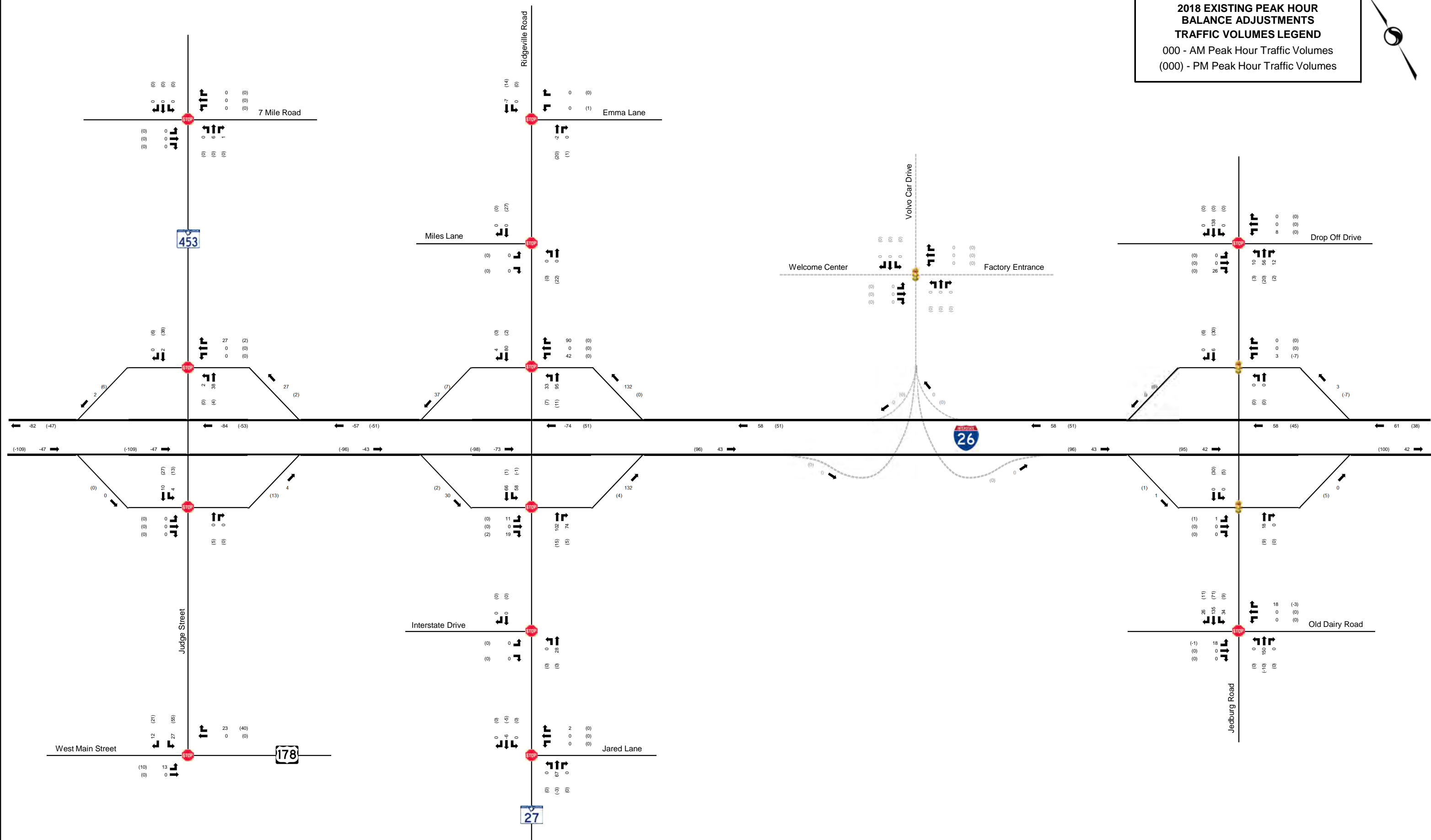


June 2019

A.3 2018 BALANCE ADJUSTMENTS



**2018 EXISTING PEAK HOUR
BALANCE ADJUSTMENTS
TRAFFIC VOLUMES LEGEND**
000 - AM Peak Hour Traffic Volumes
(000) - PM Peak Hour Traffic Volumes



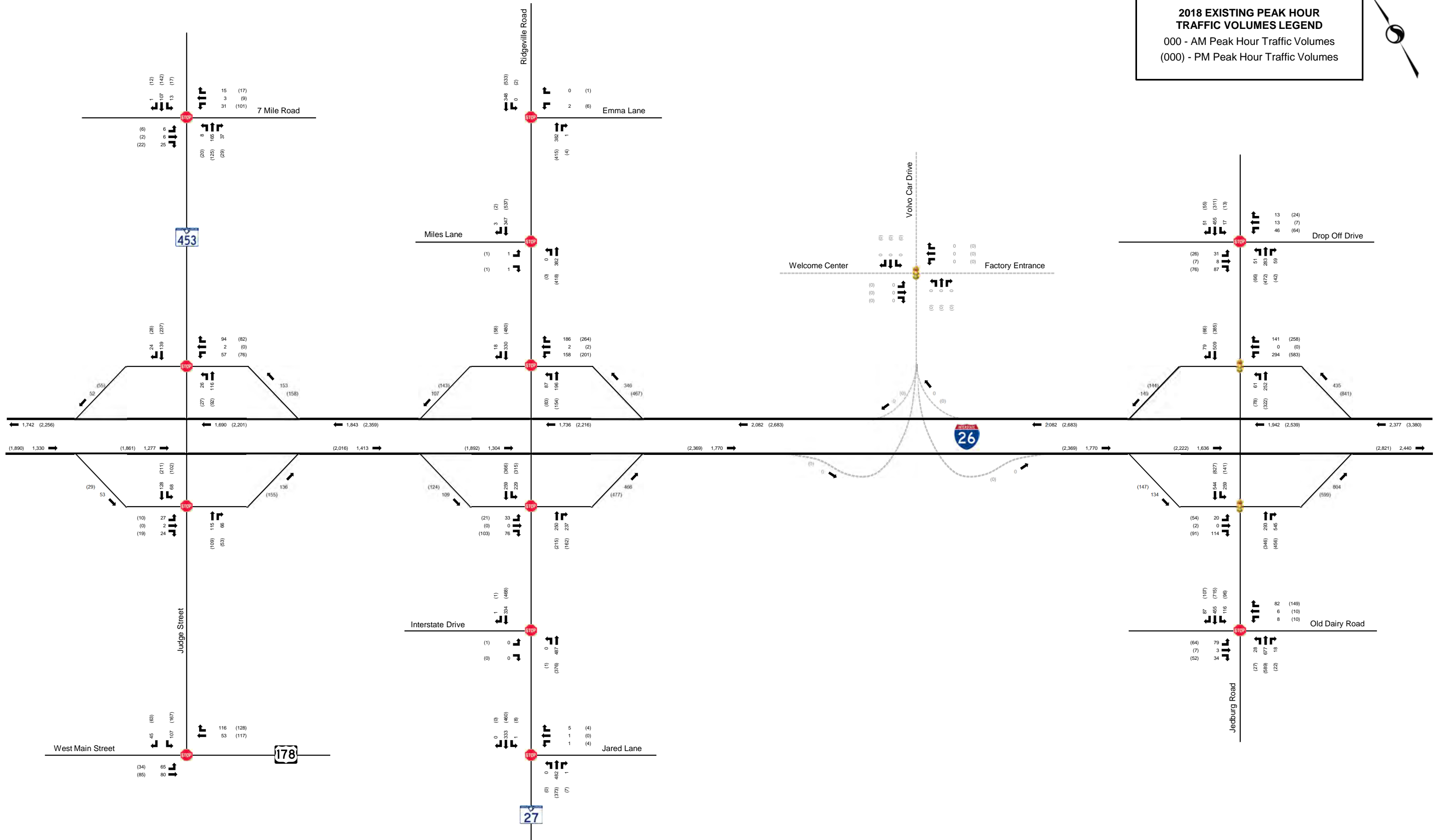
I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

June 2019

A.4 2018 BALANCED



**2018 EXISTING PEAK HOUR
TRAFFIC VOLUMES LEGEND**
000 - AM Peak Hour Traffic Volumes
(000) - PM Peak Hour Traffic Volumes



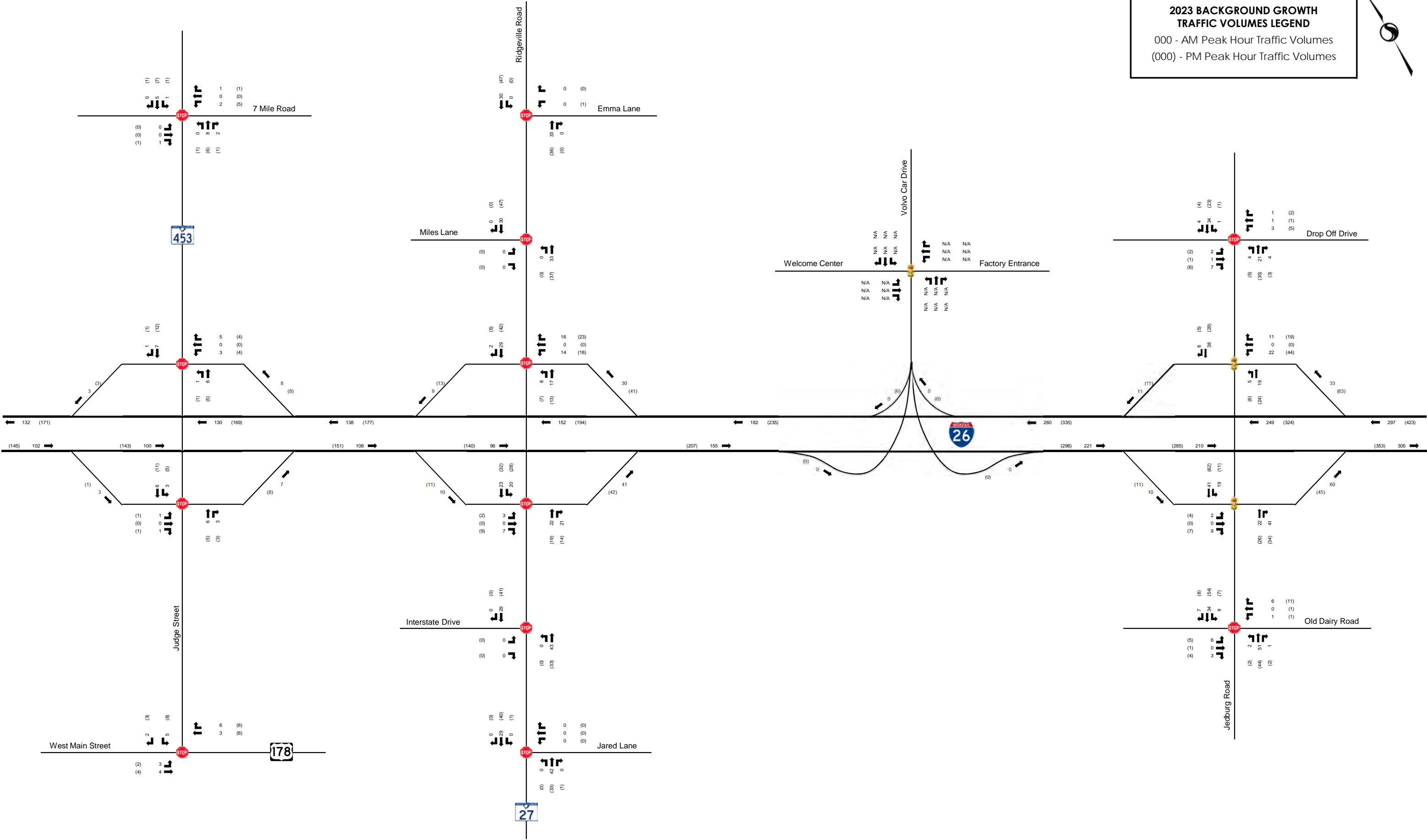
June 2019

A.5 2023 BACKGROUND GROWTH



2023 BACKGROUND GROWTH
TRAFFIC VOLUMES LEGEND

000 - AM Peak Hour Traffic Volumes
(000) - PM Peak Hour Traffic Volumes



I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

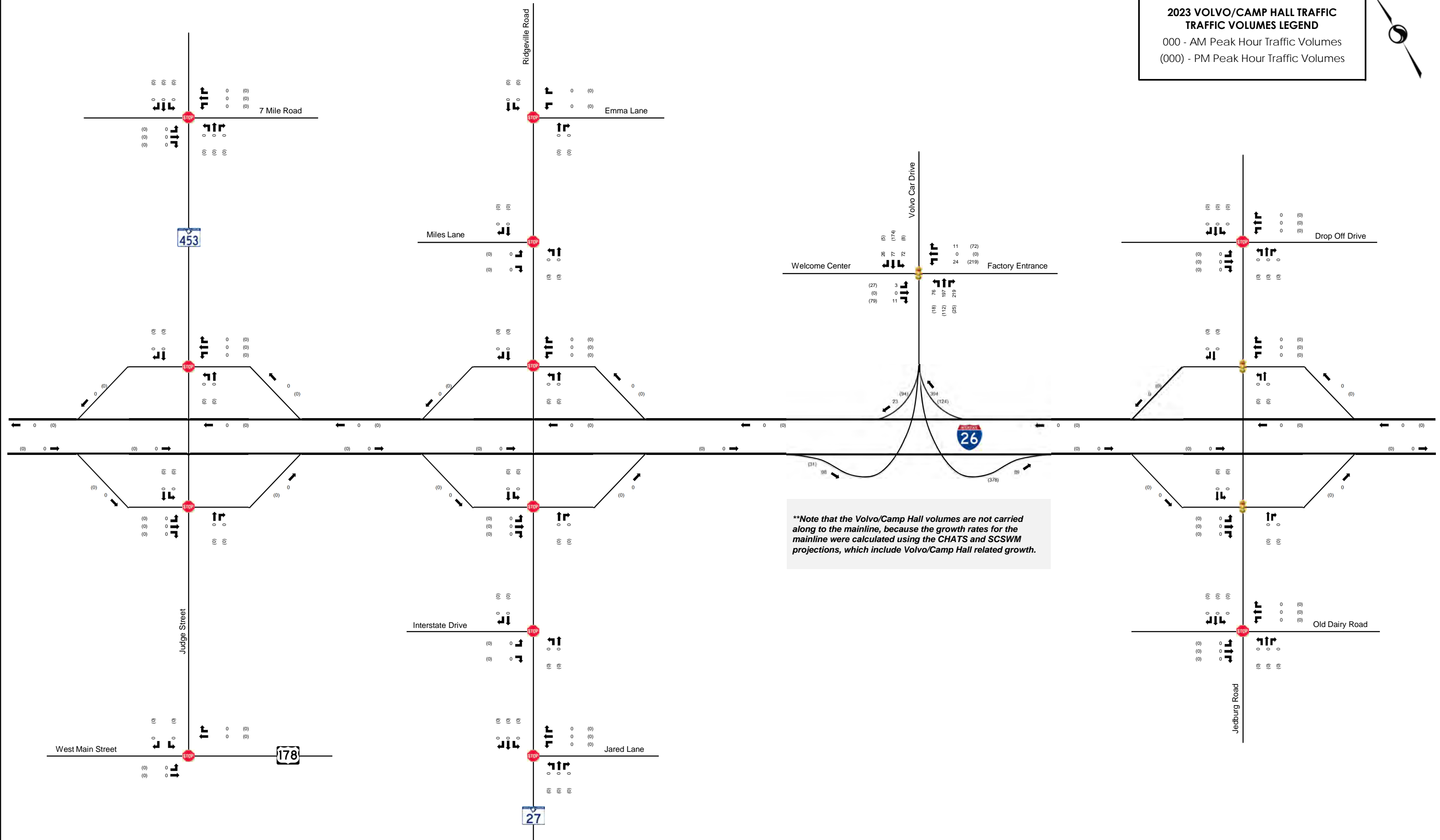
June 2019

A.6 2023 VOLVO TRAFFIC



2023 VOLVO/CAMP HALL TRAFFIC TRAFFIC VOLUMES LEGEND

000 - AM Peak Hour Traffic Volumes
(000) - PM Peak Hour Traffic Volumes



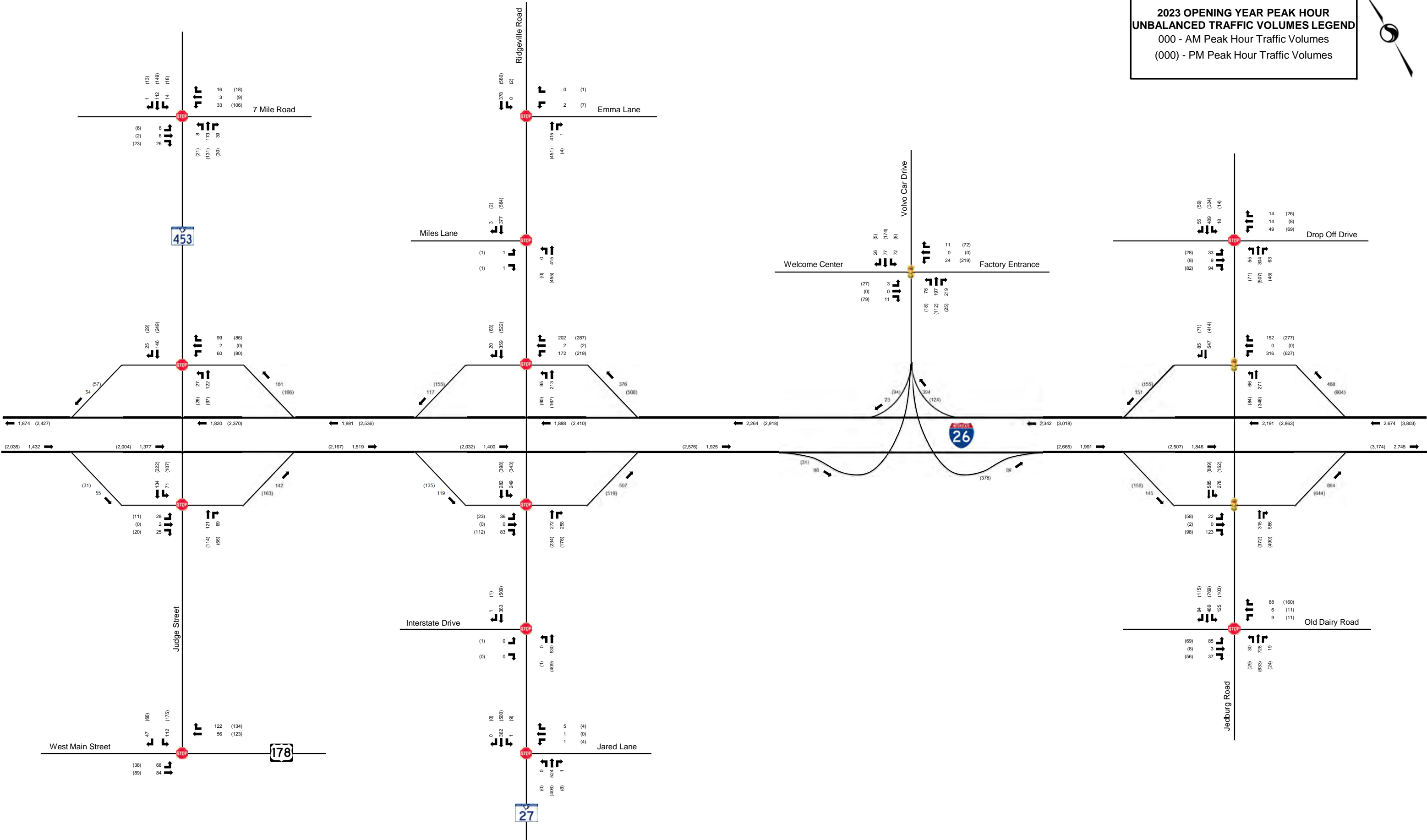
I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

June 2019

A.7 2023 UNBALANCED



2023 OPENING YEAR PEAK HOUR
UNBALANCED TRAFFIC VOLUMES LEGEND
000 - AM Peak Hour Traffic Volumes
(000) - PM Peak Hour Traffic Volumes



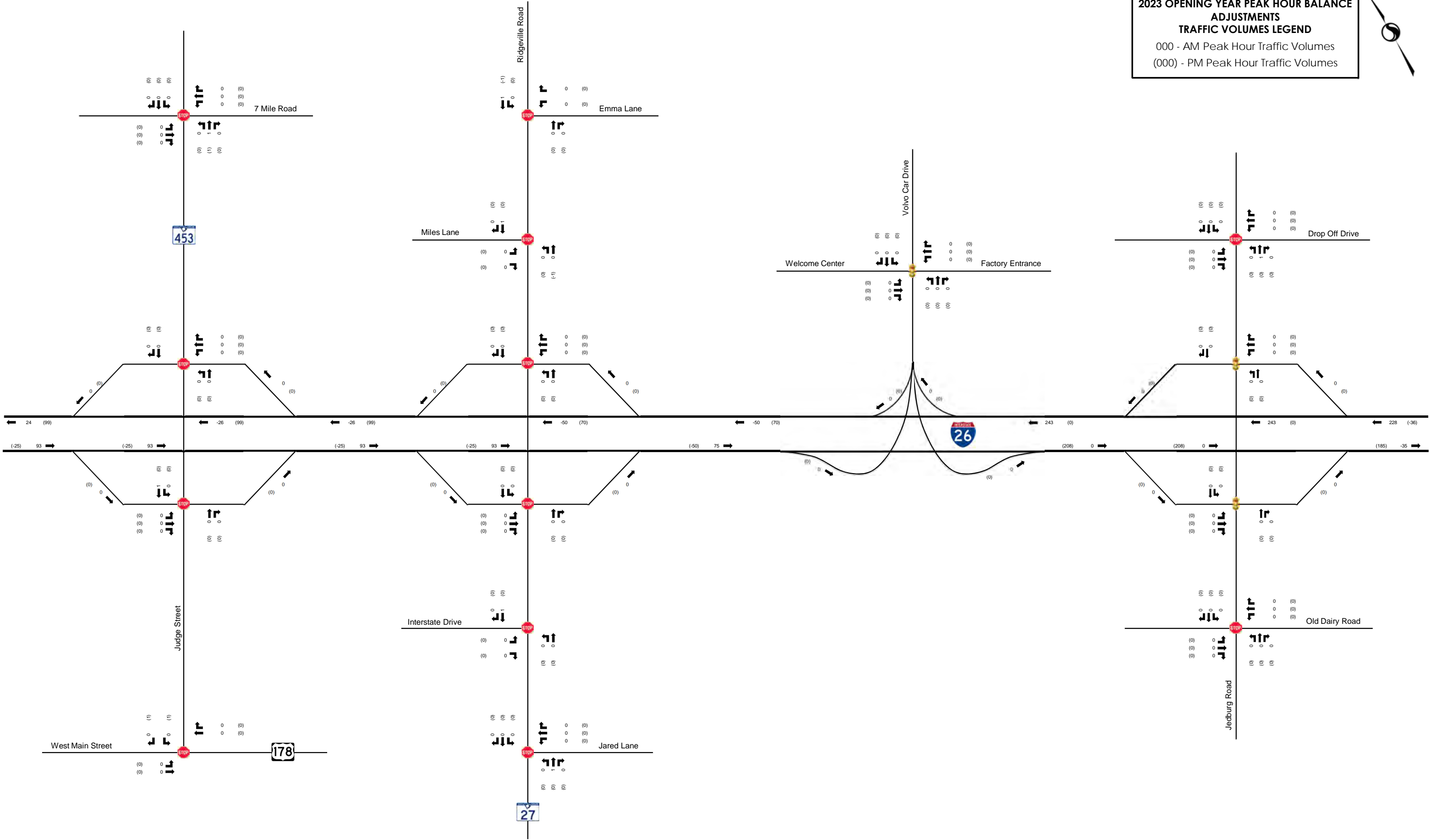
June 2019

A.8 2023 BALANCE ADJUSTMENTS



2023 OPENING YEAR PEAK HOUR BALANCE
ADJUSTMENTS
TRAFFIC VOLUMES LEGEND

000 - AM Peak Hour Traffic Volumes
(000) - PM Peak Hour Traffic Volumes



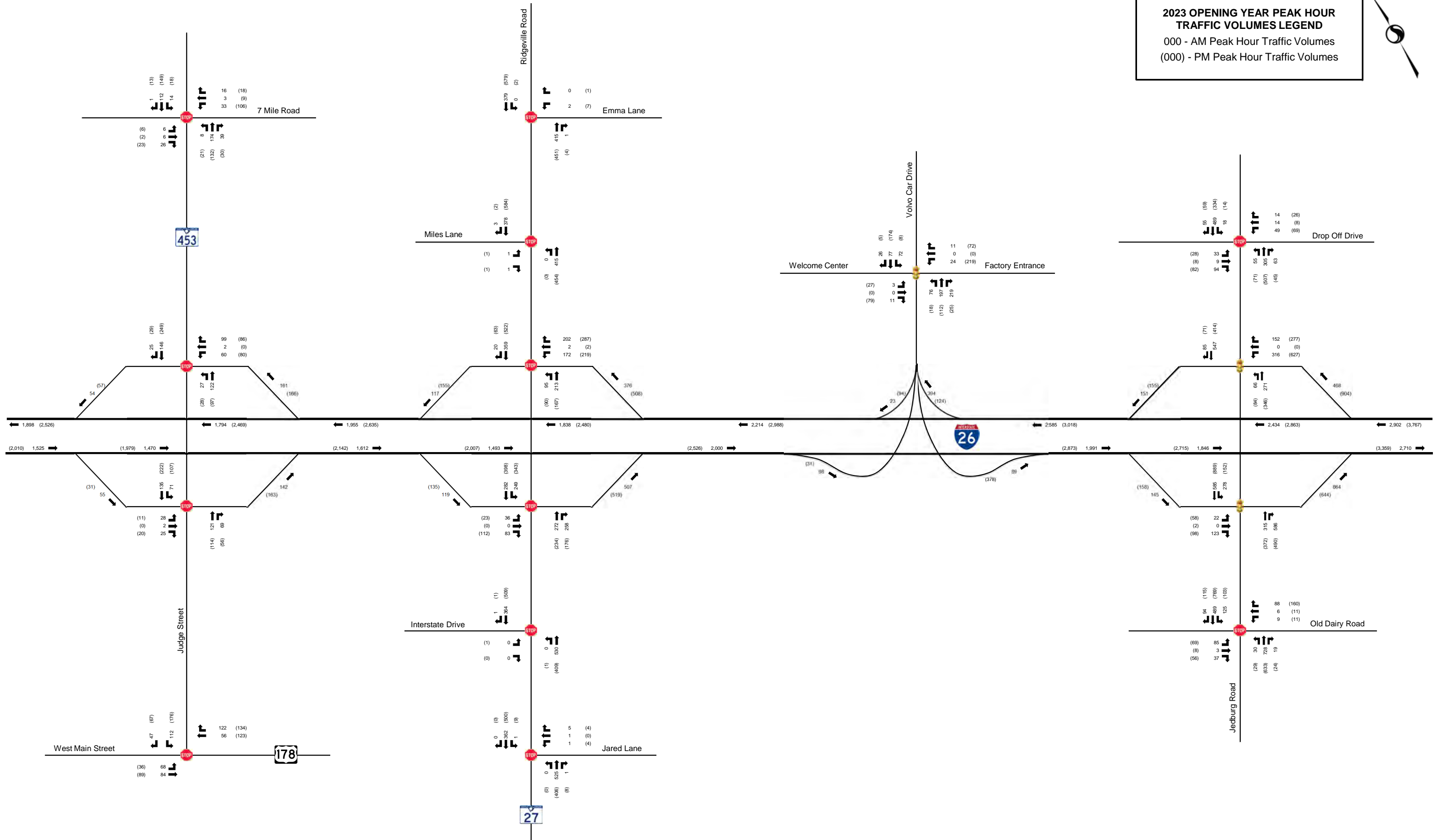
I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

June 2019

A.9 2023 BALANCED



**2023 OPENING YEAR PEAK HOUR
TRAFFIC VOLUMES LEGEND**
000 - AM Peak Hour Traffic Volumes
(000) - PM Peak Hour Traffic Volumes



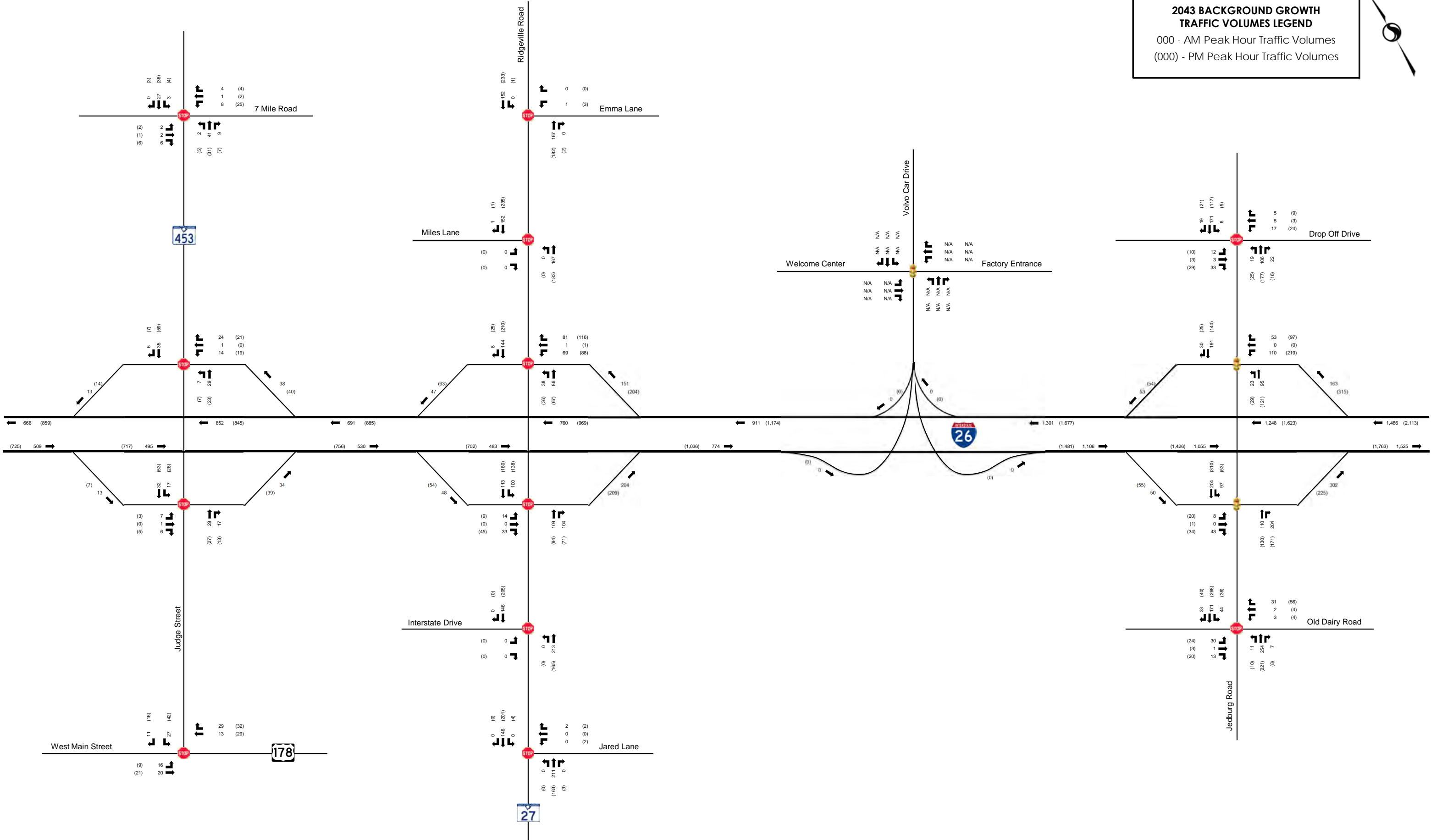
June 2019

A.10 2043 BACKGROUND GROWTH



2043 BACKGROUND GROWTH
TRAFFIC VOLUMES LEGEND

000 - AM Peak Hour Traffic Volumes
(000) - PM Peak Hour Traffic Volumes



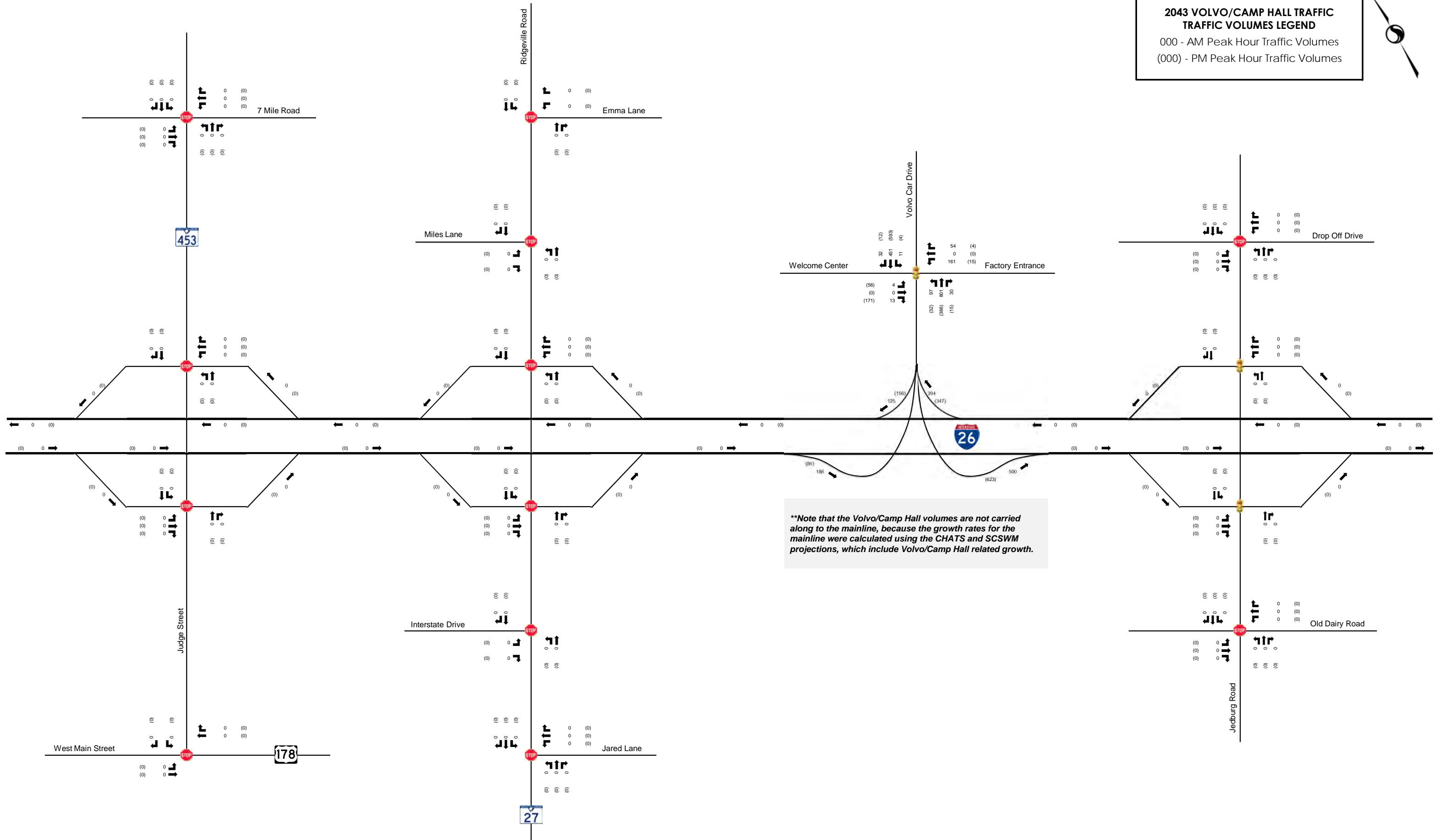
I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

June 2019

A.11 2043 VOLVO TRAFFIC



**2043 VOLVO/CAMP HALL TRAFFIC
TRAFFIC VOLUMES LEGEND**
000 - AM Peak Hour Traffic Volumes
(000) - PM Peak Hour Traffic Volumes



I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

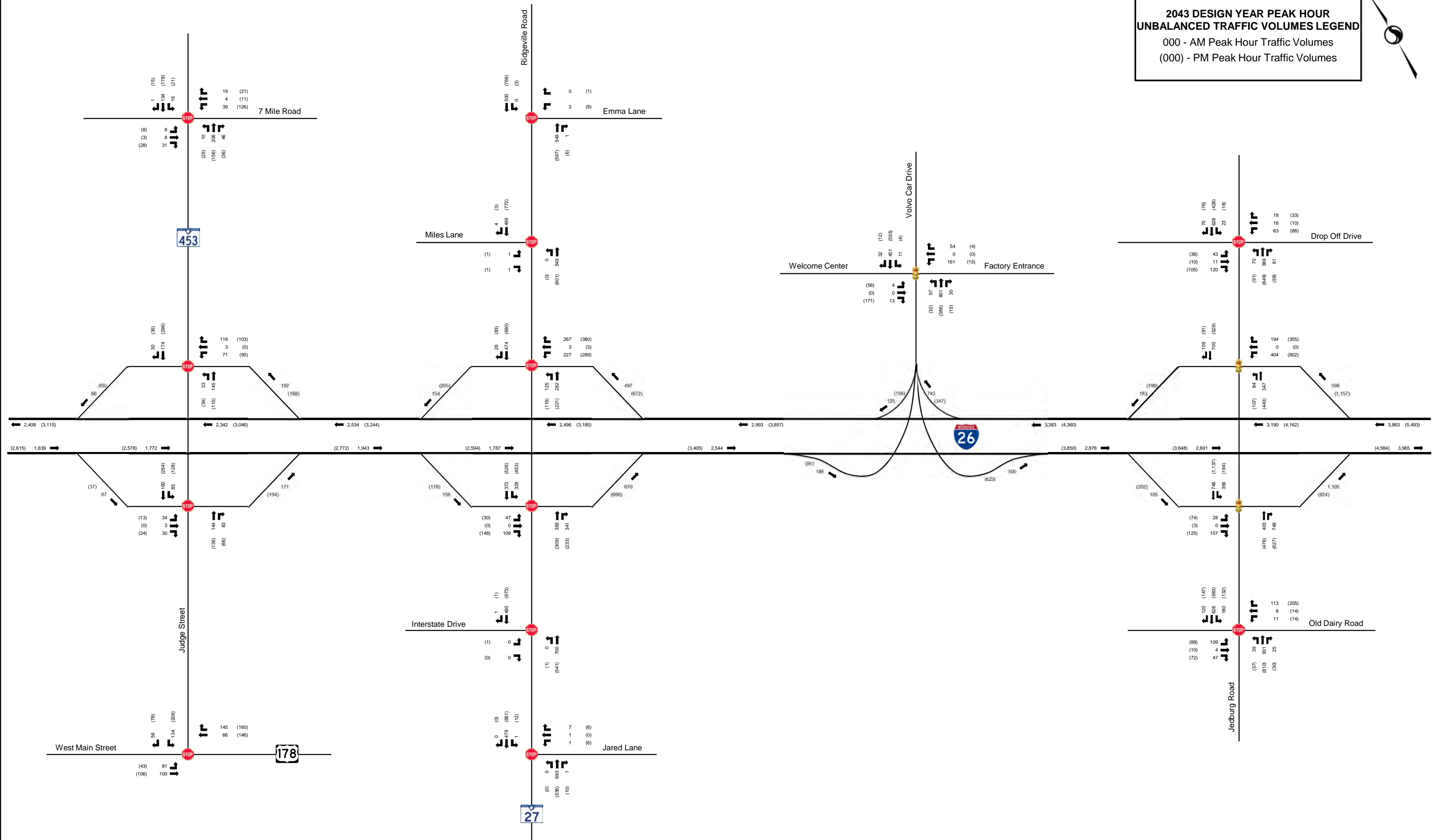
June 2019

A.12 2043 UNBALANCED



2043 DESIGN YEAR PEAK HOUR
UNBALANCED TRAFFIC VOLUMES LEGEND

000 - AM Peak Hour Traffic Volumes
(000) - PM Peak Hour Traffic Volumes



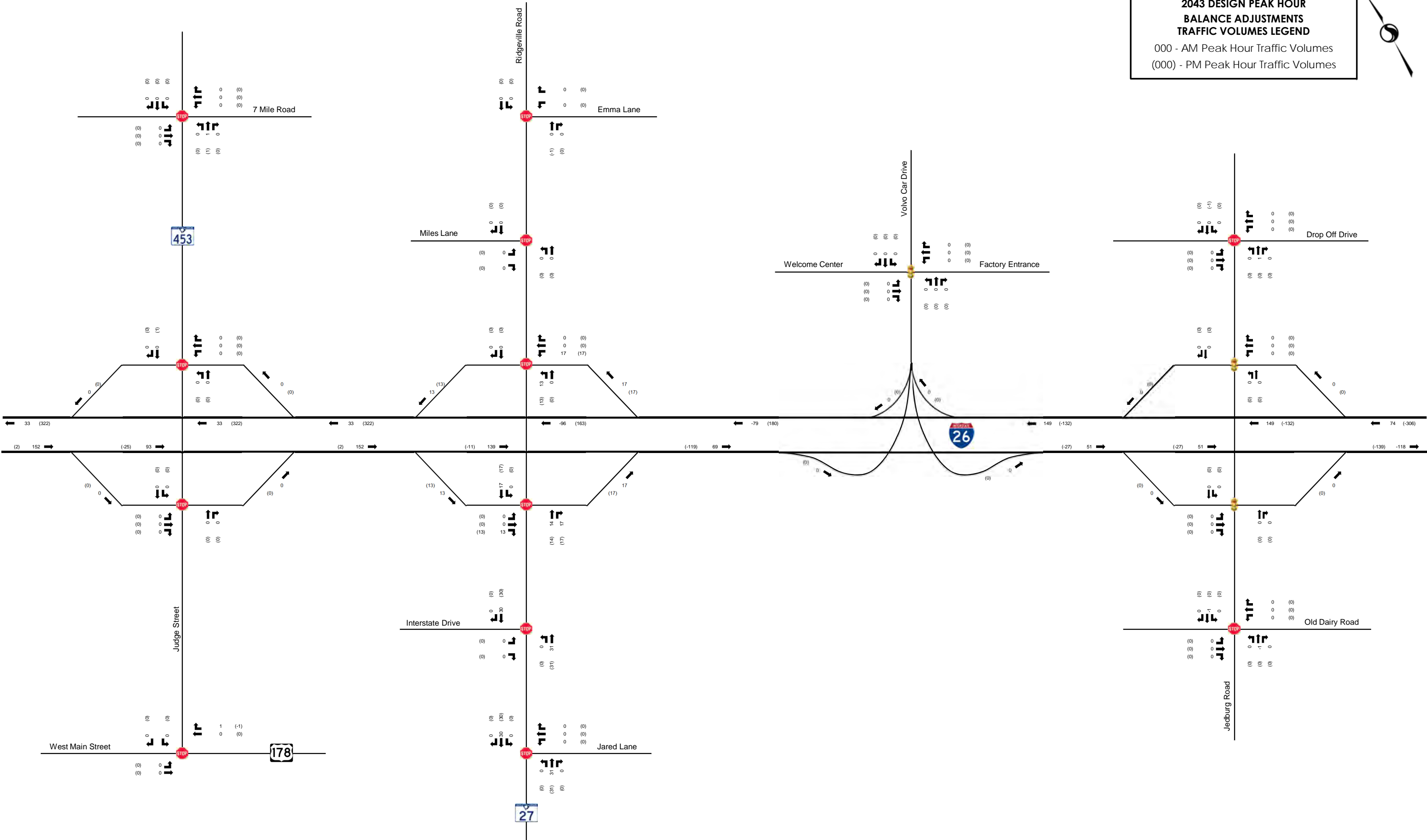
June 2019

A.13 2043 BALANCE ADJUSTMENTS



2043 DESIGN PEAK HOUR
BALANCE ADJUSTMENTS
TRAFFIC VOLUMES LEGEND

000 - AM Peak Hour Traffic Volumes
(000) - PM Peak Hour Traffic Volumes



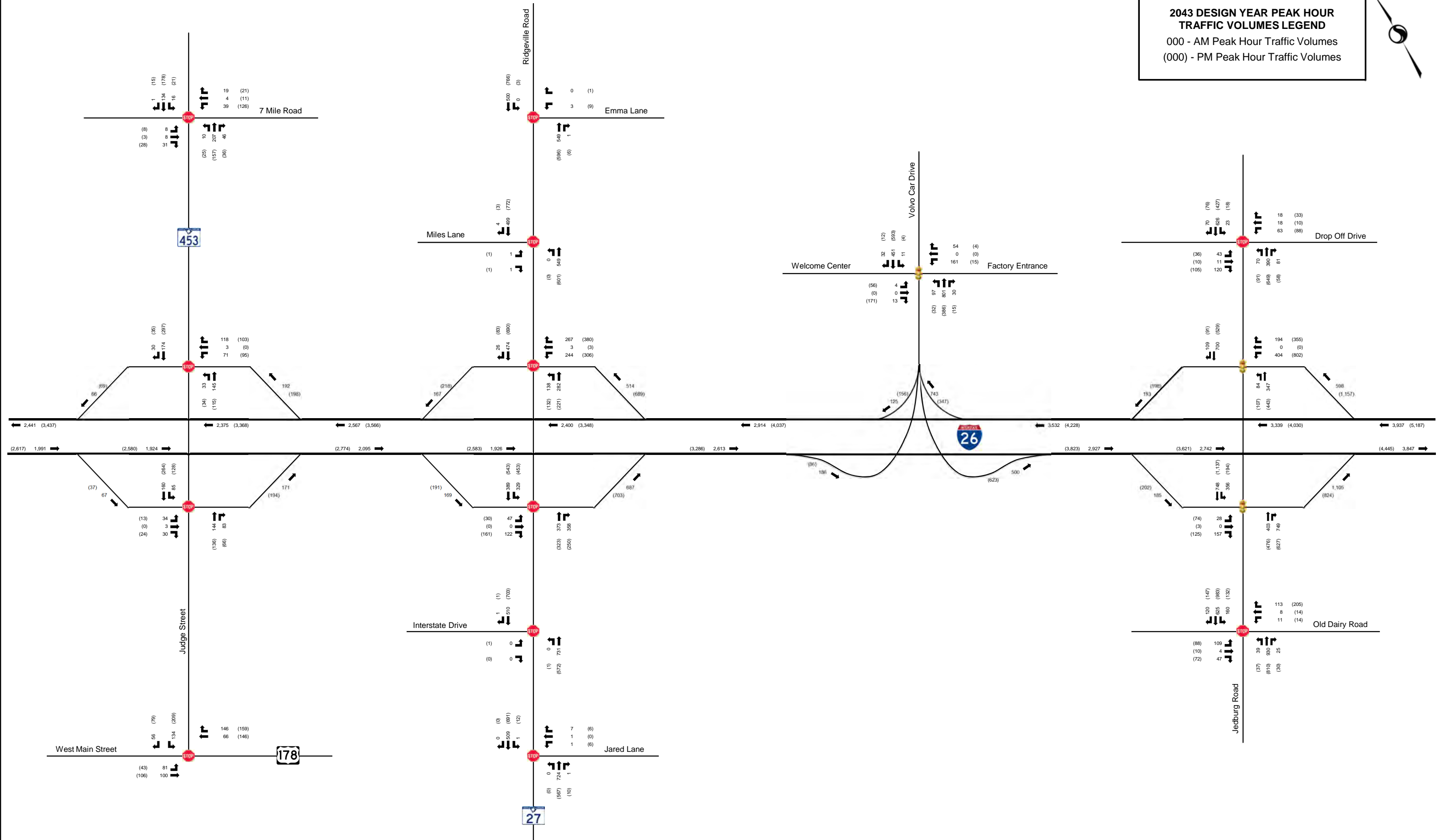
I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

June 2019

A.14 2043 BALANCED



**2043 DESIGN YEAR PEAK HOUR
TRAFFIC VOLUMES LEGEND**
000 - AM Peak Hour Traffic Volumes
(000) - PM Peak Hour Traffic Volumes



June 2019

A.15 VOLVO TRAFFIC SCHEDULES



I-26 & Volvo Car Drive Hourly Distribution Assumptions - 2019 Buildout
(From Volvo Car Drive IJR - 2016)

Time	Volvo Office		Volvo 1st Shift		Total Camp Hall (assume 25% during Volvo peaks)		Construction (assume 40% during Volvo peaks)		Total Entering Vehicles (30 Min)		Total Exiting Vehicles (30 Min)	
	Enter	Exit	Enter	Exit	Enter	Exit	Enter	Exit	(30 min)	(60 min)	(30 min)	(60 min)
5:00 AM									0	586	0	76
5:30 AM	6	1	450	50	40	15	90	10	586	1,172	76	153
6:00 AM	5	1	450	50	41	16	90	10	586	586	77	77
6:30 AM									0	0	0	0
7:00 AM									0	304	0	68
7:30 AM	47	6			122	47	135	15	304	608	68	137
8:00 AM	47	7			122	47	135	15	304	304	69	69
8:30 AM									0	0	0	0
9:00 AM									0	0	0	0
9:30 AM									0	0	0	0
10:00 AM									0	0	0	0
10:30 AM									0	0	0	0
11:00 AM									0	0	0	0
11:30 AM									0	0	0	0
12:00 PM									0	0	0	0
12:30 PM									0	0	0	0
1:00 PM									0	0	0	0
1:30 PM									0	0	0	0
2:00 PM									0	0	0	0
2:30 PM									0	85	0	581
3:00 PM	2	6	50	450	23	35	10	90	85	169	581	1,162
3:30 PM	1	5	50	450	23	36	10	90	84	84	581	581
4:00 PM									0	0	0	0
4:30 PM									0	95	0	292
5:00 PM	11	50			69	107	15	135	95	191	292	583
5:30 PM	11	49			70	107	15	135	96	96	291	291
6:00 PM									0	0	0	0
6:30 PM									0	0	0	0
7:00 PM									0	0	0	0
7:30 PM									0	0	0	0
8:00 PM									0	0	0	0
8:30 PM									0	0	0	0
9:00 PM									0	0	0	0
9:30 PM									0	0	0	0
10:00 PM									0	0	0	0
10:30 PM									0	0	0	0
11:00 PM									0	0	0	0
11:30 PM									0	0	0	0
12:00 AM									0	0	0	0
12:30 AM									0	0	0	0
1:00 AM									0	0	0	0
1:30 AM									0	0	0	0
2:00 AM									0	0	0	0
2:30 AM									0	0	0	0
3:00 AM									0	0	0	0
3:30 AM									0	0	0	0
4:00 AM									0	0	0	0
4:30 AM									0	0	0	0

I-26 & Volvo Car Drive Hourly Distribution Assumptions - 2039 Buildout
(From Volvo Car Drive IJR - 2016)

Time	Volvo Office		Volvo 1st Shift		Volvo 2nd Shift		Volvo 3rd Shift		Volvo Trucks		Total Camp Hall - 1/3 Office Operations		Total Camp Hall - 2/3 Manufacturing - 1st Shift		Total Camp Hall - 2/3 Manufacturing - 2nd Shift		Total Camp Hall - 2/3 Manufacturing - 3rd Shift		Total Entering Vehicles (30 Min)		Total Exiting Vehicles (30 Min)	
	Enter	Exit	Enter	Exit	Enter	Exit	Enter	Exit	Enter	Exit	Enter	Exit	Enter	Exit	Enter	Exit	Enter	Exit	(30 min)	(60 min)	(30 min)	(60 min)
5:00 AM									14	14									14	1,108	14	148
5:30 AM			1,080	120					14	14									1,094	2,192	134	272
6:00 AM			1,080	120					18	18									1,098	1,634	138	352
6:30 AM									18	18			518	196					536	1,092	214	608
7:00 AM							20	180	18	18			518	196					556	1,146	394	772
7:30 AM	120	16					20	180	18	18	432	164							590	1,247	378	607
8:00 AM	120	15							18	18	432	163					87	33	657	761	229	279
8:30 AM									18	18							86	32	104	125	50	71
9:00 AM									21	21									21	42	21	42
9:30 AM									21	21									21	42	21	42
10:00 AM									21	21									21	42	21	42
10:30 AM									21	21									21	46	21	46
11:00 AM									25	25									25	50	25	50
11:30 AM									25	25									25	50	25	50
12:00 PM									25	25									25	50	25	50
12:30 PM									25	25									25	50	25	50
1:00 PM									25	25									25	590	25	110
1:30 PM					540	60			25	25									565	1,130	85	170
2:00 PM					540	60			25	25									565	849	85	208
2:30 PM									25	25					259	98			284	688	123	1,326
3:00 PM			120	1,080					25	25					259	98			404	549	1,203	2,308
3:30 PM			120	1,080					25	25									145	441	1,105	1,555
4:00 PM									21	21			275	429					296	592	450	900
4:30 PM									21	21			275	429					296	564	450	931
5:00 PM	21	105							18	18	229	358							268	535	481	961
5:30 PM	20	105							18	18	229	357							267	281	480	494
6:00 PM									14	14									14	28	14	28
6:30 PM									14	14									14	25	14	25
7:00 PM									11	11									11	22	11	22
7:30 PM									11	11									11	22	11	22
8:00 PM									11	11									11	22	11	22
8:30 PM									11	11									11	18	11	18
9:00 PM									7	7									7	194	7	34
9:30 PM							180	20	7	7									187	374	27	54
10:00 PM						180	20		7	7									187	240	27	106
10:30 PM									7	7							46	72	53	163	79	694
11:00 PM					60	540			4	4							46	71	110	174	615	1,159
11:30 PM					60	540			4	4									64	205	544	762
12:00 AM									3	3					138	215			141	281	218	435
12:30 AM									3	3					137	214			140	143	217	220
1:00 AM									3	3									3	6	3	6
1:30 AM									3	3									3	7	3	7
2:00 AM									4	4									4	8	4	8
2:30 AM									4	4									4	11	4	11
3:00 AM									7	7									7	14	7	14
3:30 AM									7	7									7	18	7	18
4:00 AM									11	11									11	22	11	22
4:30 AM									11	11									11	25	11	25

June 2019

Appendix B HCM INPUT AND OUTPUT SHEETS

B.1 2018 EXISTING



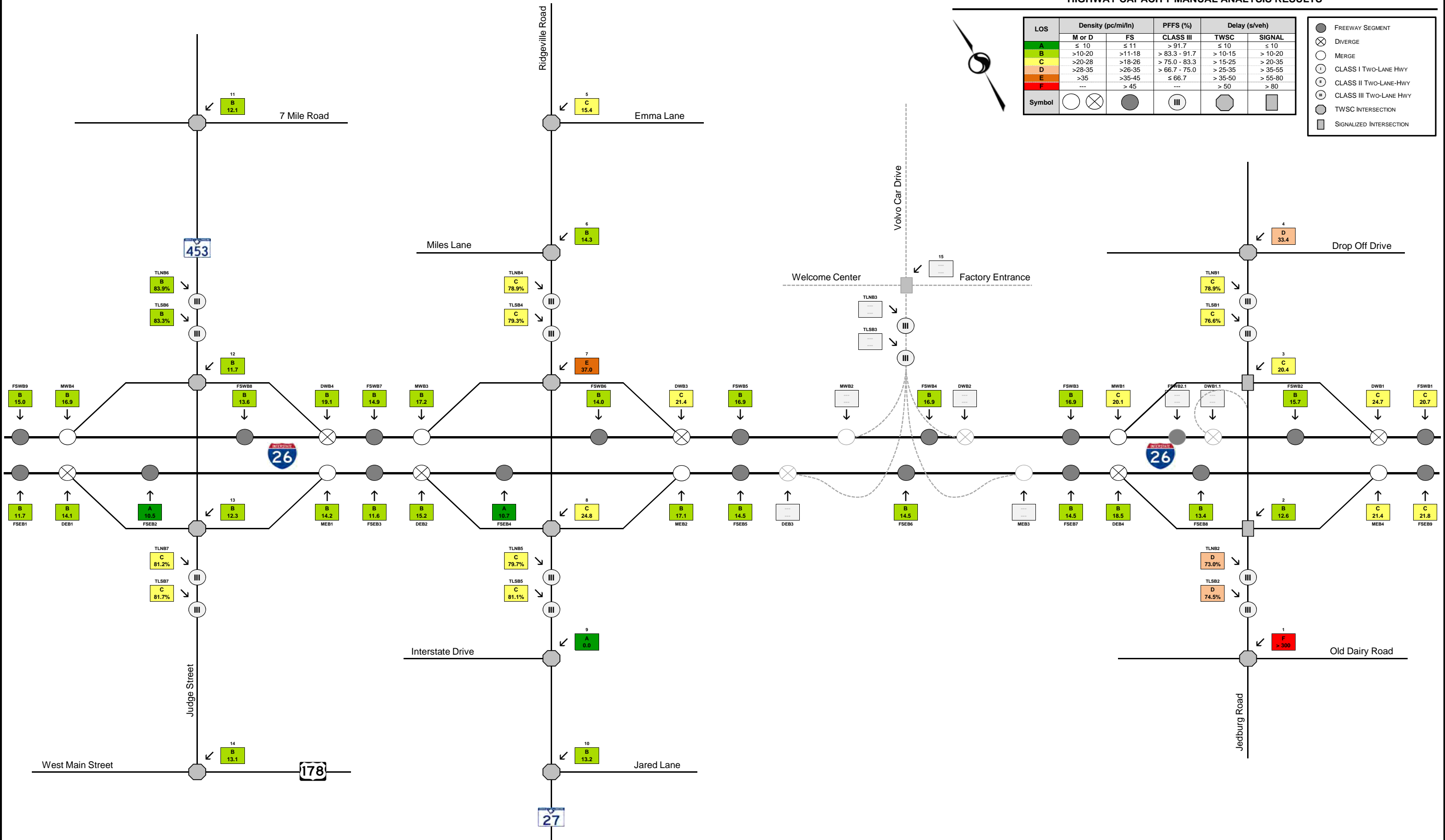
LOS	Density (pc/mi/ln)		PFFS (%)	Delay (s/veh)		<div>I-26 Widening (MM 187 - MM 194)</div> <div>2018 Existing AM Peak Hour - HCM Analysis Results</div> <div>Performance Measures</div> <div><div><div><div></div><div>Stantec</div></div><div>November, 2018</div></div></div>																				Notes:					
	M or D	FS	CLASS III HWY	TWSC	SIGNAL																					FS	=	Freeway Segment			
A	≤ 10	≤ 11	> 91.7	≤ 10	≤ 10																					M	=	Merge Area			
B	>10-20	>11-18	> 83.3 - 91.7	> 10-15	> 10-20																					D	=	Diverge Area			
C	>20-28	>18-26	> 75.0 - 83.3	> 15-25	> 20-35	TL	=	Two-Lane Segment																							
D	>28-35	>26-35	> 66.7 - 75.0	> 25-35	> 35-55	TWSC	=	Two-Way Stop Control																							
E	>35	>35-45	≤ 66.7	> 35-50	> 55-80	SIGNAL	=	Signalized Intersection																							
F	---	> 45	---	> 50	> 80																										
I-26 Section						Ramp Information						Mainline Information										HCM Results									
						Volume (veh/hr)	% HV	PHF	Length A/D lane (ft)	FFS**** (MPH)	Adj. Ramp Up/Down	Adj. Ramp Volume (veh/hr)	Adj. Ramp Distance (ft)	Adj. Ramp HV%	Adj. Ramp PHF	Volume (veh/hr)	% HV	PHF	No. of Lanes	Terrain	Driver Pop Factor	LW (ft)	LC (ft)	TRD (ramp/mi)	FFS (mph)	Flow Rate (pc/h/ln)	Average Speed (mph)	Density (pc/mi/ln)	Type	LOS	
FSEB1	---	---	---	---	---	---	---	---	---	---	1,330	24%	0.91	2	Level	1.00	12	6	1.00	72.2	818	70.0	11.7	FS	B						
DEB1	53	53%	0.95	465	35	Down/On	136	1,850	36%	0.81	1,330	24%	0.91	2	---	---	---	---	---	---	---	57.8	14.1	D	B						
FSEB2	---	---	---	---	---	---	---	---	---	---	1,277	24%	0.91	2	Level	1.00	12	6	0.33	74.1	786	75.0	10.5	FS	A						
MEB1	136	36%	0.81	800	35	Up/Off	53	1,850	53%	0.95	1,277	24%	0.91	2	---	---	---	---	---	---	---	62.0	14.2	M	B						
FSEB3	---	---	---	---	---	---	---	---	---	---	1,413	24%	0.91	2	Level	1.00	12	6	0.00	75.4	870	75.4	11.6	FS	B						
DEB2	109	23%	0.82	450	35	Down/On	466	2,200	16%	0.89	1,413	24%	0.91	2	---	---	---	---	---	---	---	57.6	15.2	D	B						
FSEB4	---	---	---	---	---	---	---	---	---	---	1,304	24%	0.91	2	Level	1.00	12	6	0.33	74.2	802	75.0	10.7	FS	A						
MEB2	466	16%	0.89	800	35	Up/Off	109	2,200	23%	0.82	1,304	24%	0.91	2	---	---	---	---	---	---	---	62.0	17.1	M	B						
FSEB5	---	---	---	---	---	---	---	---	---	---	1,770	24%	0.91	2	Level	1.00	12	6	0.00	75.4	1,089	74.9	14.5	FS	B						
DEB3	0	10%	0.92	1,200	35	Down/On	0	3,500	10%	0.92	1,770	24%	0.91	2	---	---	---	---	---	---	---	---	---	D	---						
FSEB6	---	---	---	---	---	---	---	---	---	---	1,770	24%	0.91	2	Level	1.00	12	6	0.00	75.4	1,089	74.9	14.5	FS	B						
MEB3	0	10%	0.92	2,000	35	Up/Off	0	3,500	10%	0.92	1,770	24%	0.91	2	---	---	---	---	---	---	---	---	---	M	---						
FSEB7	---	---	---	---	---	---	---	---	---	---	1,770	24%	0.91	2	Level	1.00	12	6	0.00	75.4	1,089	74.9	14.5	FS	B						
DEB4	134	29%	0.64	500	35	Down/On	804	1,600	11%	0.86	1,770	24%	0.91	2	---	---	---	---	---	---	---	57.4	18.5	D	B						
FSEB8	---	---	---	---	---	---	---	---	---	---	1,636	24%	0.91	2	Level	1.00	12	6	0.50	73.6	1,007	75.0	13.4	FS	B						
MEB4	804	11%	0.86	1,120	35	Up/Off	134	1,600	29%	0.64	1,636	24%	0.91	2	---	---	---	---	---	---	---	61.0	21.4	M	C						
FSEB9	---	---	---	---	---	---	---	---	---	---	2,440	24%	0.91	2	Level	1.00	12	6	1.20	71.6	1,502	68.9	21.8	FS	C						
FSWB1	---	---	---	---	---	---	---	---	---	---	2,377	22%	0.92	2	Level	1.00	12	6	1.20	71.6	1,434	69.4	20.7	FS	C						
DWB1	435	10%	0.86	465	35	Down/On	140	1,600	11%	0.78	2,377	22%	0.92	2	---	---	---	---	---	---	---	56.7	24.7	D	C						
FSWB2	---	---	---	---	---	---	---	---	---	---	1,942	22%	0.92	2	Level	1.00	12	6	0.50	73.6	1,172	74.7	15.7	FS	B						
DWB1.1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---						
FSWB2.1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---						
MWB1	140	11%	0.78	800	35	Up/Off	435	1,600	10%	0.86	1,942	22%	0.92	2	---	---	---	---	---	---	---	61.0	20.1	M	C						
FSWB3	---	---	---	---	---	---	---	---	---	---	2,082	22%	0.92	2	Level	1.00	12	6	0.00	75.4	1,256	74.3	16.9	FS	B						
DWB2	0	10%	0.92	3,000	35	Down/On	0	2,400	10%	0.92	2,082	22%	0.92	2	---	---	---	---	---	---	---	---	---	D	---						
FSWB4	---	---	---	---	---	---	---	---	---	---	2,082	22%	0.92	2	Level	1.00	12	6	0.00	75.4	1,256	74.3	16.9	FS	B						
MWB2	0	10%	0.92	1,800	35	Up/Off	0	2,400	10%	0.92	2,082	22%	0.92	2	---	---	---	---	---	---	---	---	---	M	---						
FSWB5	---	---	---	---	---	---	---	---	---	---	2,082	22%	0.92	2	Level	1.00	12	6	0.00	75.4	1,256	74.3	16.9	FS	B						
DWB3	346	25%	0.94	500	35	Down/On	107	2,200	16%	0.84	2,082	22%	0.92	2	---	---	---	---	---	---	---	57.0	21.4	D	C						
FSWB6	---	---	---	---	---	---	---	---	---	---	1,736	22%	0.92	2	Level	1.00	12	6	0.33	74.1	1,047	75.0	14.0	FS	B						
MWB3	107	16%	0.84	900	35	Up/Off	346	2,200	25%	0.94	1,736	22%	0.92	2	---	---	---	---	---	---	---	62.0	17.2	M	B						
FSWB7	---	---	---	---	---	---	---	---	---	---	1,843	22%	0.92	2	Level	1.00	12	6	0.00	75.4	1,112	74.9	14.9	FS	B						
DWB4	153	46%	0.88	475	35	Down/On	52	1,850	36%	0.92	1,843	22%	0.92	2	---	---	---	---	---	---	---	57.5	19.1	D	B						
FSWB8	---	---	---	---	---	---	---	---	---	---	1,690	22%	0.92	2	Level	1.00	12	6	0.33	74.1	1,020	75.0	13.6	FS	B						
MWB4	52	36%	0.92	800	35	Up/Off	153	1,850	46%	0.88	1,690	22%	0.92	2	---	---	---	---	---	---	---	62.0	16.9	M	B						
FSWB9	---	---	---	---	---	---	---	---	---	---	1,742	22%	0.92	2	Level	1.00	12	6	1.00	72.2	1,051	70.0	15.0	FS	B						
Two-Lane Side-Street Section	Segment Information													Intentionally Left Blank						HCM Results											
	Terrain	SW (ft)	LW (ft)	Seg. Length (mi)**	PHF	Truck/ Bus %	Rec. Veh %***	% NPZ	Access Point Density	Analysis Direction Volume	Opposing Direction Volume	BFFS (mph)	FFS (mph)							V/C Ratio	PTSF	Average Speed (mph)	PFFS	Hwy Class	LOS						
TLNB1	Level	2.5	11.5	1.0	0.93	11%	0%	100%	14	327	523	50	43.5							0.21	56.6%	34.3	78.9%	III	C						
TLSB1	Level	2.5	11.5	1.0	0.93	11%	0%	100%	14	523	327	50	43.5							0.33	75.4%	33.3	76.6%	III	C						
TLNB2	Level	2.5	11.5	1.0	0.94	11%	0%	60%	14	723	497	50	43.5							0.46	82.1%	31.8	73.0%	III	D						
TLSB2	Level	2.5	11.5	1.0	0.94	11%	0%	60%	14	497	723	50	43.5							0.32	67.6%	32.4	74.5%	III	D						
TLNB3	Level	6.0	12.0	1.0	0.92	10%	0%	20%	8	0	0	50	48.0							---	---	---	---	III	---						
TLSB3	Level	6.0	12.0	1.0	0.92	10%	0%	20%	8	0	0	50	48.0							---	---	---	---	III	---						
TLNB4	Level	1.0	12.0	1.0	0.93	16%	0%	100%	30	382	348	55	43.3							0.25	66.7%	34.2	78.9%	III	C						
TLSB4	Level	1.0	12.0	1.0	0.93	16%	0%	100%	30	348	382	55	43.3							0.23	64.0%	34.4	79.3%	III	C						
TLNB5	Level	2.5	11.5	1.0	0.91	16%	0%	100%	10	483																					

LOS	Density (pc/mi/ln)		PFFS (%)	Delay (s/veh)		<div>I-26 Widening (MM 187 - MM 194)</div> <div>2018 Existing PM Peak Hour - HCM Analysis Results</div> <div>Performance Measures</div> <div><div><div><div></div><div>Stantec</div></div><div>November, 2018</div></div></div> <th colspan="6">Notes:</th>																			Notes:					
	M or D	FS	CLASS III HWY	TWSC	SIGNAL																				FS = Freeway Segment					
					M = Merge Area																									
					D = Diverge Area																									
A	≤ 10	≤ 11	> 91.7	≤ 10	≤ 10						TL = Two-Lane Segment																			
B	>10-20	>11-18	> 83.3 - 91.7	> 10-15	> 10-20						TWSC = Two-Way Stop Control																			
C	>20-28	>18-26	> 75.0 - 83.3	> 15-25	> 20-35						SIGNAL = Signalized Intersection																			
D	>28-35	>26-35	> 66.7 - 75.0	> 25-35	> 35-55																									
E	>35	>35-45	≤ 66.7	> 35-50	> 55-80																									
F	---	> 45	---	> 50	> 80																									
I-26 Section	Ramp Information										Mainline Information										HCM Results									
	Volume (veh/hr)	% HV	PHF	Length A/D lane (ft)	FFS**** (MPH)	Adj. Ramp Up/Down	Adj. Ramp Volume (veh/hr)	Adj. Ramp Distance (ft)	Adj. Ramp HV%	Adj. Ramp PHF	Volume (veh/hr)	% HV	PHF	No. of Lanes	Terrain	Driver Pop Factor	LW (ft)	LC (ft)	TRD (ramp/mi)	FFS (mph)	Flow Rate (pc/h/ln)	Average Speed (mph)	Density (pc/mi/ln)	Type	LOS					
FSEB1	---	---	---	---	---	---	---	---	---	---	1,890	10%	0.92	2	Level	1.00	12	6	1.00	72.2	1,079	70.0	15.4	FS	B					
DEB1	29	52%	0.81	465	35	Down/On	155	1,850	24%	0.83	1,890	10%	0.92	2	---	---	---	---	---	---	---	57.9	18.6	D	B					
FSEB2	---	---	---	---	---	---	---	---	---	---	1,861	10%	0.92	2	Level	1.00	12	6	0.33	74.1	1,062	75.0	14.2	FS	B					
MEB1	155	24%	0.83	800	35	Up/Off	29	1,850	52%	0.81	1,861	10%	0.92	2	---	---	---	---	---	---	---	61.0	18.6	M	B					
FSEB3	---	---	---	---	---	---	---	---	---	---	2,016	10%	0.92	2	Level	1.00	12	6	0.00	75.4	1,150	74.8	15.4	FS	B					
DEB2	124	8%	0.82	450	35	Down/On	477	2,200	7%	0.78	2,016	10%	0.92	2	---	---	---	---	---	---	---	57.6	20.0	D	B					
FSEB4	---	---	---	---	---	---	---	---	---	---	1,892	10%	0.92	2	Level	1.00	12	6	0.33	74.2	1,080	74.9	14.4	FS	B					
MEB2	477	7%	0.78	800	35	Up/Off	124	2,200	8%	0.82	1,892	10%	0.92	2	---	---	---	---	---	---	---	61.0	21.9	M	C					
FSEB5	---	---	---	---	---	---	---	---	---	---	2,369	10%	0.92	2	Level	1.00	12	6	0.00	75.4	1,352	73.6	18.4	FS	C					
DEB3	0	10%	0.92	1,200	35	Down/On	0	3,500	10%	0.92	2,369	10%	0.92	2	---	---	---	---	---	---	---	---	---	D	---					
FSEB6	---	---	---	---	---	---	---	---	---	---	2,369	10%	0.92	2	Level	1.00	12	6	0.00	75.4	1,352	73.6	18.4	FS	C					
MEB3	0	10%	0.92	2,000	35	Up/Off	0	3,500	10%	0.92	2,369	10%	0.92	2	---	---	---	---	---	---	---	---	---	M	---					
FSEB7	---	---	---	---	---	---	---	---	---	---	2,369	10%	0.92	2	Level	1.00	12	6	0.00	75.4	1,352	73.6	18.4	FS	C					
DEB4	147	19%	0.91	500	35	Down/On	599	1,600	7%	0.84	2,369	10%	0.92	2	---	---	---	---	---	---	---	57.6	23.0	D	C					
FSEB8	---	---	---	---	---	---	---	---	---	---	2,222	10%	0.92	2	Level	1.00	12	6	0.50	73.6	1,268	74.2	17.1	FS	B					
MEB4	599	7%	0.84	1,120	35	Up/Off	147	1,600	19%	0.91	2,222	10%	0.92	2	---	---	---	---	---	---	---	60.0	23.7	M	C					
FSEB9	---	---	---	---	---	---	---	---	---	---	2,821	10%	0.92	2	Level	1.00	12	6	1.20	71.6	1,610	68.1	23.7	FS	C					
FSWB1	---	---	---	---	---	---	---	---	---	---	3,380	15%	0.93	2	Level	1.00	12	6	1.20	71.6	1,953	63.4	30.8	FS	D					
DWB1	841	6%	0.98	465	35	Down/On	144	1,600	7%	0.86	3,380	15%	0.93	2	---	---	---	---	---	---	---	55.8	33.7	D	D					
FSWB2	---	---	---	---	---	---	---	---	---	---	2,539	15%	0.93	2	Level	1.00	12	6	0.50	73.6	1,467	72.6	20.2	FS	C					
DWB1.1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---					
FSWB2.1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---					
MWB1	144	7%	0.86	800	35	Up/Off	841	1,600	6%	0.98	2,539	15%	0.93	2	---	---	---	---	---	---	---	60.0	24.6	M	C					
FSWB3	---	---	---	---	---	---	---	---	---	---	2,683	15%	0.93	2	Level	1.00	12	6	0.00	75.4	1,551	71.6	21.7	FS	C					
DWB2	0	10%	0.92	3,000	35	Down/On	0	2,400	10%	0.92	2,683	15%	0.93	2	---	---	---	---	---	---	---	---	---	D	---					
FSWB4	---	---	---	---	---	---	---	---	---	---	2,683	15%	0.93	2	Level	1.00	12	6	0.00	75.4	1,551	71.6	21.7	FS	C					
MWB2	0	10%	0.92	1,800	35	Up/Off	0	2,400	10%	0.92	2,683	15%	0.93	2	---	---	---	---	---	---	---	---	---	M	---					
FSWB5	---	---	---	---	---	---	---	---	---	---	2,683	15%	0.93	2	Level	1.00	12	6	0.00	75.4	1,551	71.6	21.7	FS	C					
DWB3	467	7%	0.91	500	35	Down/On	143	2,200	7%	0.74	2,683	15%	0.93	2	---	---	---	---	---	---	---	56.7	26.4	D	C					
FSWB6	---	---	---	---	---	---	---	---	---	---	2,216	15%	0.93	2	Level	1.00	12	6	0.33	74.1	1,281	74.1	17.3	FS	B					
MWB3	143	7%	0.74	900	35	Up/Off	467	2,200	7%	0.91	2,216	15%	0.93	2	---	---	---	---	---	---	---	61.0	21.3	M	C					
FSWB7	---	---	---	---	---	---	---	---	---	---	2,359	15%	0.93	2	Level	1.00	12	6	0.00	75.4	1,363	73.5	18.5	FS	C					
DWB4	158	21%	0.89	475	35	Down/On	55	1,850	24%	0.82	2,359	15%	0.93	2	---	---	---	---	---	---	---	57.5	23.4	D	C					
FSWB8	---	---	---	---	---	---	---	---	---	---	2,201	15%	0.93	2	Level	1.00	12	6	0.33	74.1	1,272	74.2	17.1	FS	B					
MWB4	55	24%	0.82	800	35	Up/Off	158	1,850	21%	0.89	2,201	15%	0.93	2	---	---	---	---	---	---	---	61.0	21.4	M	C					
FSWB9	---	---	---	---	---	---	---	---	---	---	2,256	15%	0.93	2	Level	1.00	12	6	1.00	72.2	1,304	69.9	18.7	FS	C					
Two-Lane Side-Street Section	Segment Information													Intentionally Left Blank						HCM Results										
	Terrain	SW (ft)	LW (ft)	Seg. Length (mi)**	PHF	Truck/ Bus %	Rec. Veh %***	% NPZ	Access Point Density	Analysis Direction Volume	Opposing Direction Volume	BFFS (mph)	FFS (mph)							V/C Ratio	PTSF	Average Speed (mph)	PFFS	Hwy Class	LOS					
TLNB1	Level	2.5	11.5	1.0	0.95	7%	0%	100%	14	522	379	50	43.5	Intentionally Left Blank						0.33	74.5%	33.3	76.7%	III	C					
TLSB1	Level	2.5	11.5	1.0	0.95	7%	0%	100%	14	379	522	50	43.5							0.24	61.6%	34.0	78.2%	III	C					
TLNB2	Level	2.5	11.5	1.0	0.92	7%	0%	60%	14	638	777	50	43.5							0.41	76.1%	30.7	70.6%	III	D					
TLSB2	Level	2.5	11.5	1.0	0.92	7%	0%	60%	14	777	638	50	43.5							0.50	83.6%	30.4	69.9%	III	D					
TLNB3	Level	6.0	12.0	1.0	0.92	10%	0%	20%	8	0	0	50	48.0							---	---	---	---	III	---					
TLSB3	Level	6.0	12.0	1.0	0.92	10%	0%	20%	8	0	0	50	48.0							---	---	---	---	III	---					
TLNB4	Level	1.0	12.0	1.0	0.79	7%	0%	100%	30	416	535	55	43.3							0.31	70.0%	32.3	74.6%	III	D					
TLSB4	Level	1.0	12.0	1.0	0.79	7%	0%	100%	30	535	416	55	43.3							0.40	79.8%	31.8	73.4%	III	D					
TLNB5	Level	2.5	11.5	1.0	0.83	7%	0%	100%	10	380	464	55	49.5							0.27	66.8%	39.5	79.8%	III	C					
TLSB5	Level	2.5	11.5	1.0	0.83	7%	0%	10																						

2018 EXISTING AM PEAK HOUR
HIGHWAY CAPACITY MANUAL ANALYSIS RESULTS

LOS	Density (pc/mi/ln)		PFFS (%)		Delay (s/veh)	
	M or D	FS	CLASS III	TWSC	SIGNAL	
A	≤ 10	≤ 11	> 91.7	≤ 10	≤ 10	
B	>10-20	>11-18	> 83.3 - 91.7	> 10-15	> 10-20	
C	>20-28	>18-26	> 75.0 - 83.3	> 15-25	> 20-35	
D	>28-35	>26-35	> 66.7 - 75.0	> 25-35	> 35-55	
E	>35	>35-45	≤ 66.7	> 35-50	> 55-80	
F	---	> 45	---	> 50	> 80	
Symbol						

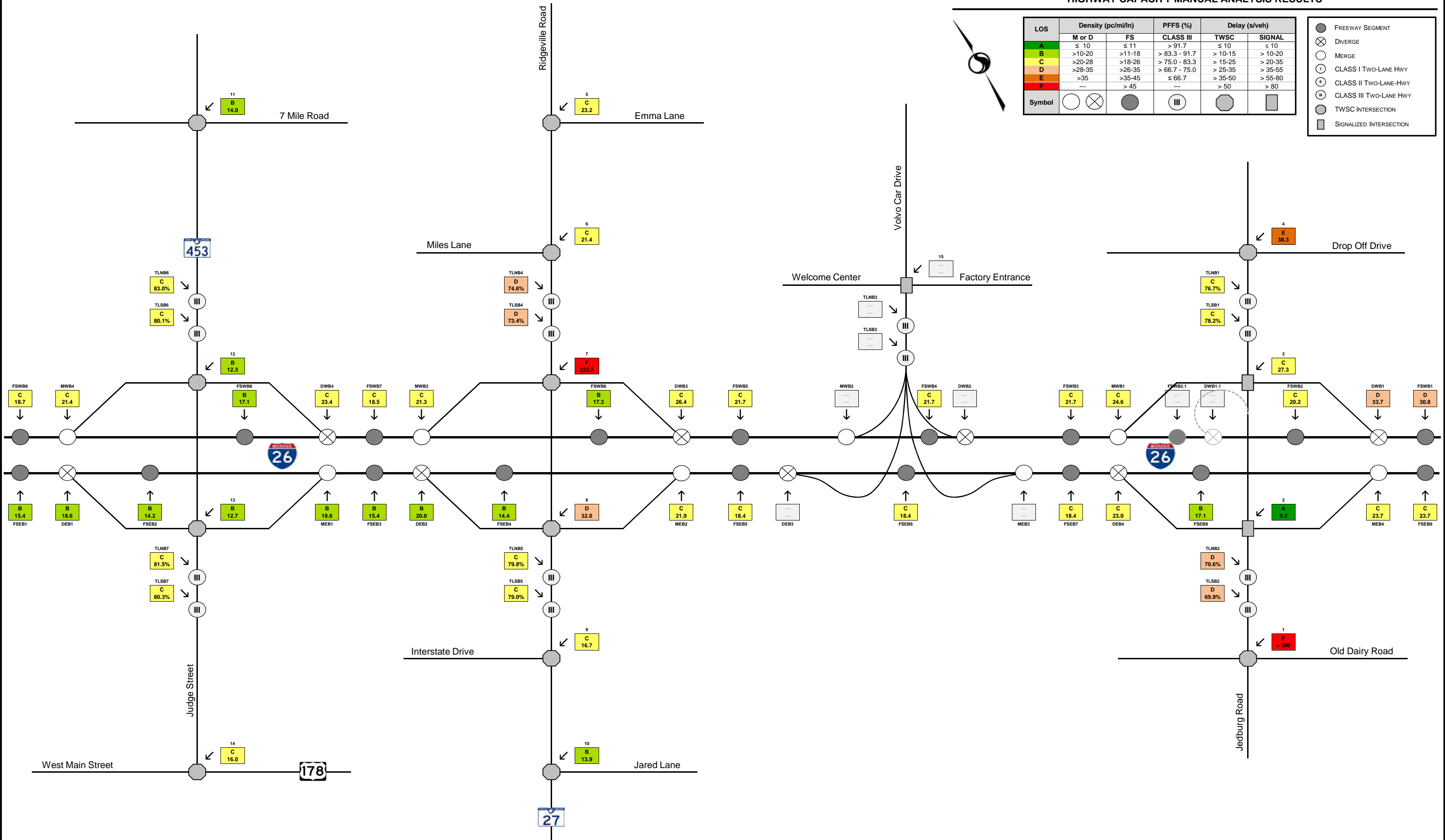
- FREEWAY SEGMENT
- DIVERGE
- MERGE
- CLASS I TWO-LANE HWY
- CLASS II TWO-LANE HWY
- CLASS III TWO-LANE HWY
- TWSC INTERSECTION
- SIGNALIZED INTERSECTION



2018 EXISTING PM PEAK HOUR
HIGHWAY CAPACITY MANUAL ANALYSIS RESULTS

LOS	Density (pc/mi/ln)		PFFS (%)	Delay (s/veh)	
	M or D	FS	CLASS III	TWSC	SIGNAL
A	≤ 10	≤ 11	> 91.7	≤ 10	≤ 10
B	>10-20	>11-18	> 83.3 - 91.7	> 10-15	> 10-20
C	>20-28	>18-26	> 75.0 - 83.3	> 15-25	> 20-35
D	>28-35	>26-35	> 66.7 - 75.0	> 25-35	> 35-55
E	>35	>35-45	≤ 66.7	> 35-50	> 55-80
F	---	> 45	---	> 50	> 80
Symbol					

- FREEWAY SEGMENT
- DIVERGE
- MERGE
- CLASS I TWO-LANE HWY
- CLASS II TWO-LANE-HWY
- CLASS III TWO-LANE HWY
- TWSC INTERSECTION
- SIGNALIZED INTERSECTION



I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

June 2019

B.2 2023 NO BUILD



2023 NO BUILD AM PEAK HOUR
HIGHWAY CAPACITY MANUAL ANALYSIS RESULTS

LOS	Density (pc/mi/ln)		PFFS (%)	Delay (s/veh)	
	M or D	FS	CLASS III	TWSC	SIGNAL
A	≤ 10	≤ 11	> 91.7	≤ 10	≤ 10
B	>10-20	>11-18	> 83.3 - 91.7	> 10-15	> 10-20
C	>20-28	>18-26	> 75.0 - 83.3	> 15-25	> 20-35
D	>28-35	>26-35	> 66.7 - 75.0	> 25-35	> 35-55
E	>35	>35-45	≤ 66.7	> 35-50	> 55-80
F	---	> 45	---	> 50	> 80
Symbol					

FREEWAY SEGMENT

DIVERGE

MERGE

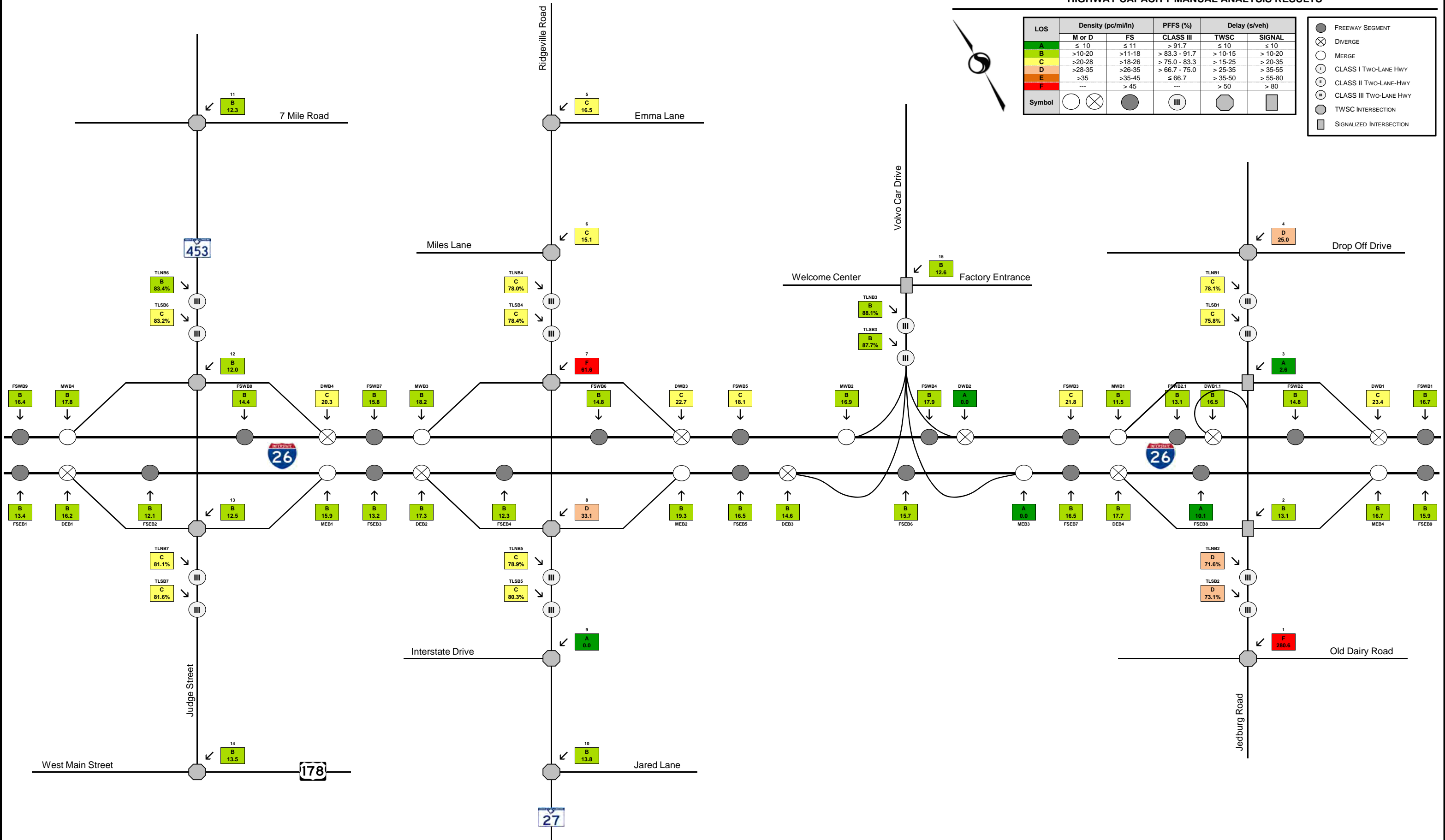
CLASS I TWO-LANE HWY

CLASS II TWO-LANE-HWY

CLASS III TWO-LANE HWY

TWSC INTERSECTION

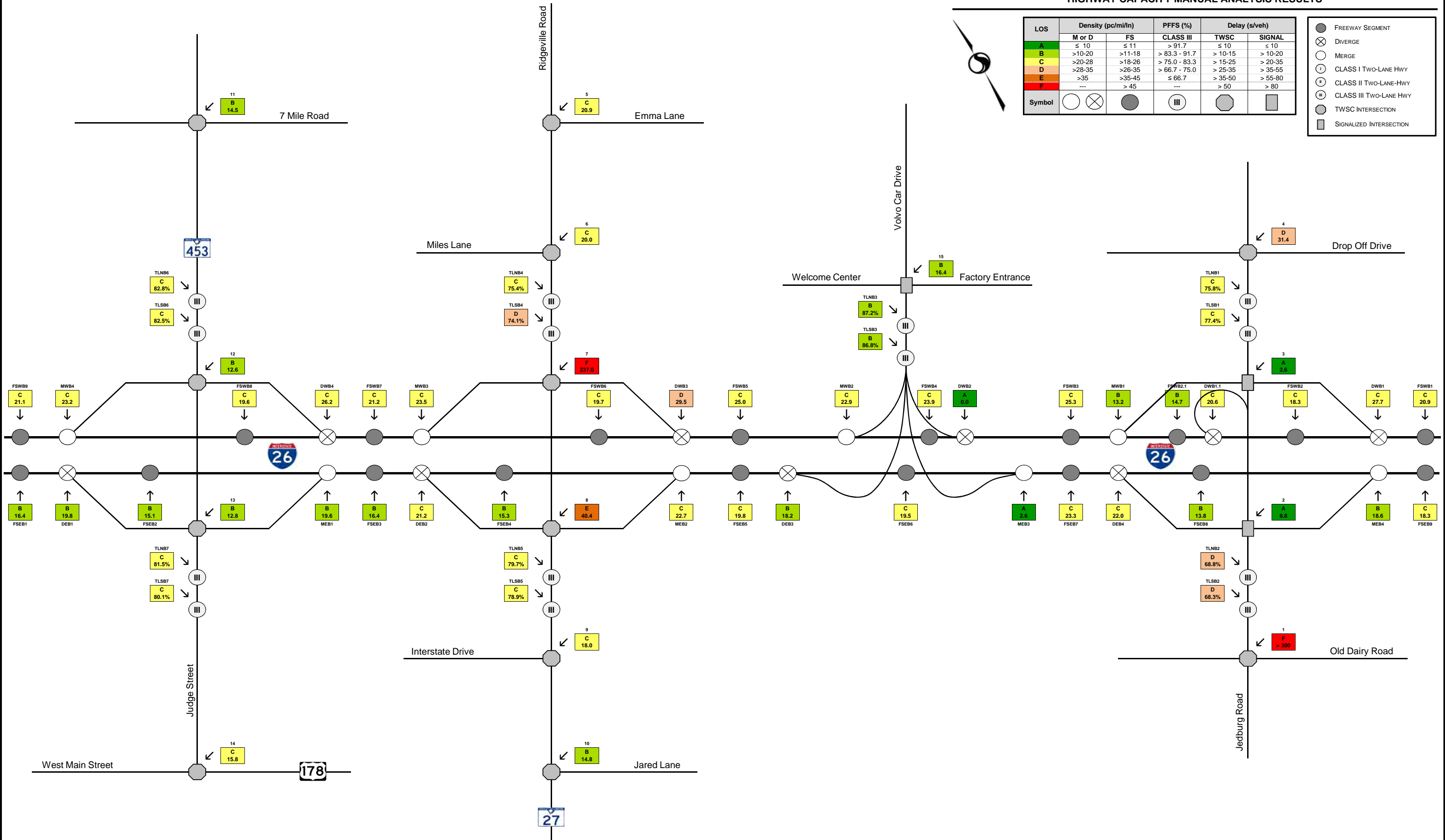
SIGNALIZED INTERSECTION



2023 NO BUILD PM PEAK HOUR
HIGHWAY CAPACITY MANUAL ANALYSIS RESULTS

LOS	Density (pc/mi/ln)		PFFS (%)	Delay (s/veh)	
	M or D	FS	CLASS III	TWSC	SIGNAL
A	≤ 10	≤ 11	> 91.7	≤ 10	≤ 10
B	>10-20	>11-18	> 83.3 - 91.7	> 10-15	> 10-20
C	>20-28	>18-26	> 75.0 - 83.3	> 15-25	> 20-35
D	>28-35	>26-35	> 66.7 - 75.0	> 25-35	> 35-55
E	>35	>35-45	≤ 66.7	> 35-50	> 55-80
F	---	> 45	---	> 50	> 80
Symbol					

- FREEWAY SEGMENT
- DIVERGE
- MERGE
- CLASS I TWO-LANE HWY
- CLASS II TWO-LANE-HWY
- CLASS III TWO-LANE HWY
- TWSC INTERSECTION
- SIGNALIZED INTERSECTION



I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

June 2019

B.3 2043 NO BUILD



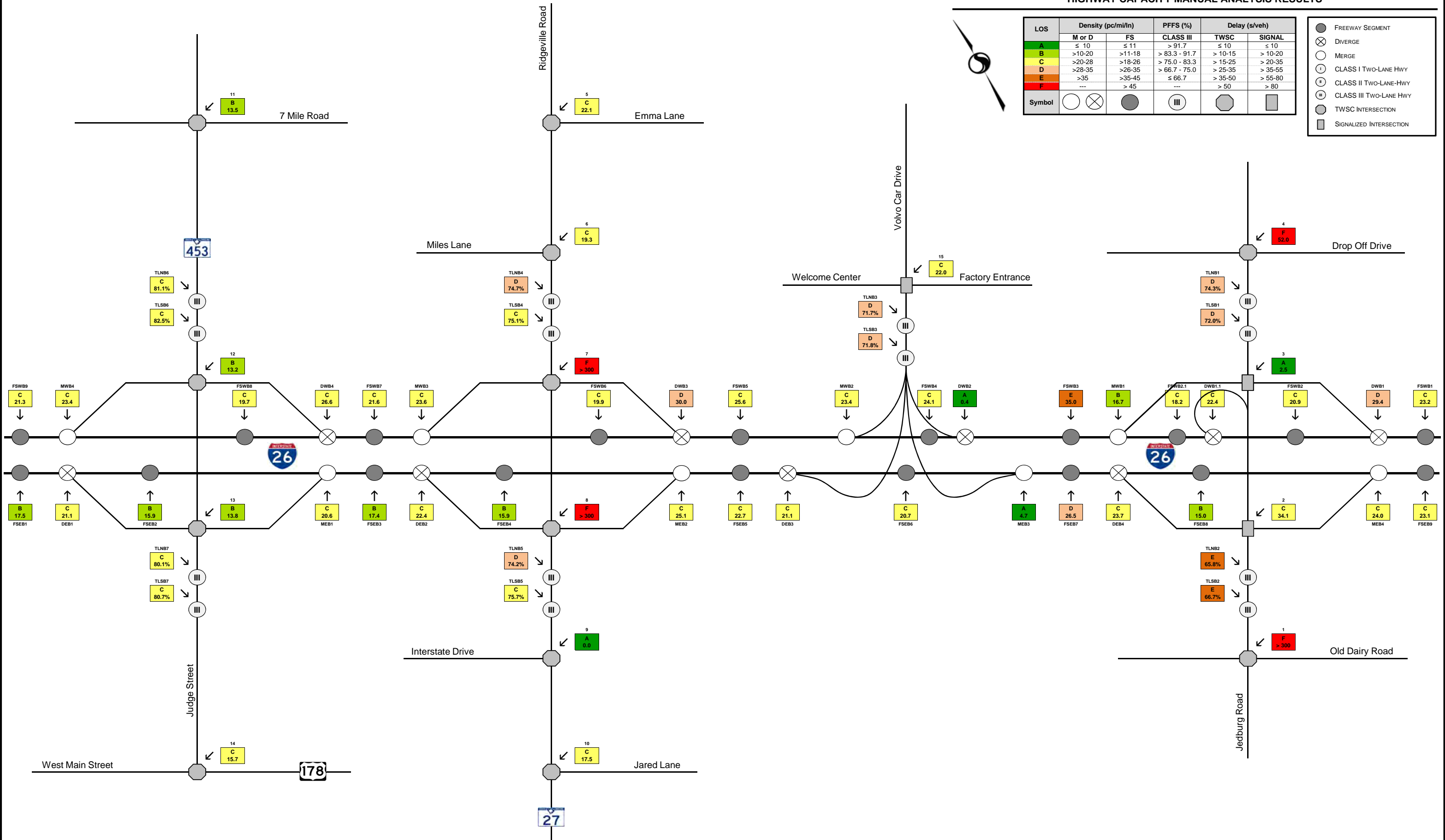
LOS	Density (pc/mi/ln)		PFFS (%)	Delay (s/veh)		<div>I-26 Widening (MM 187 - MM 194)</div> <div>2043 No Build AM Peak Hour - HCM Analysis Results</div> <div>Performance Measures</div> <div><div><div><div></div><div>Stantec</div></div><div>November, 2018</div></div></div> <th colspan="6">Notes:</th>																			Notes:					
	M or D	FS	CLASS III HWY	TWSC	SIGNAL																				FS = Freeway Segment	M = Merge Area	D = Diverge Area	TL = Two-Lane Segment	TWSC = Two-Way Stop Control	SIGNAL = Signalized Intersection
A	≤ 10	≤ 11	> 91.7	≤ 10	≤ 10																									
B	>10-20	>11-18	> 83.3 - 91.7	> 10-15	> 10-20																									
C	>20-28	>18-26	> 75.0 - 83.3	> 15-25	> 20-35																									
D	>28-35	>26-35	> 66.7 - 75.0	> 25-35	> 35-55																									
E	>35	>35-45	≤ 66.7	> 35-50	> 55-80																									
F	---	> 45	---	> 50	> 80																									
I-26 Section	Ramp Information										Mainline Information										HCM Results									
	Volume (veh/hr)	% HV	PHF	Length A/D lane (ft)	FFS**** (MPH)	Adj. Ramp Up/Down	Adj. Ramp Volume (veh/hr)	Adj. Ramp Distance (ft)	Adj. Ramp HV%	Adj. Ramp PHF	Volume (veh/hr)	% HV	PHF	No. of Lanes	Terrain	Driver Pop Factor	LW (ft)	LC (ft)	TRD (ramp/mi)	FFS (mph)	Flow Rate (pc/h/ln)	Average Speed (mph)	Density (pc/mi/ln)	Type	LOS					
FSEB1	---	---	---	---	---	---	---	---	---	---	1,991	24%	0.91	2	Level	1.00	12	6	1.00	72.2	1,225	70.0	17.5	FS	B					
DEB1	67	53%	0.95	465	35	Down/On	171	1,850	36%	0.90	1,991	24%	0.91	2	---	---	---	---	---	---	---	57.8	21.1	D	C					
FSEB2	---	---	---	---	---	---	---	---	---	---	1,924	24%	0.91	2	Level	1.00	12	6	0.33	74.1	1,184	74.7	15.9	FS	B					
MEB1	171	36%	0.90	800	35	Up/Off	67	1,850	53%	0.95	1,924	24%	0.91	2	---	---	---	---	---	---	---	61.0	20.6	M	C					
FSEB3	---	---	---	---	---	---	---	---	---	---	2,095	24%	0.91	2	Level	1.00	12	6	0.00	75.4	1,289	74.1	17.4	FS	B					
DEB2	169	29%	0.90	450	35	Down/On	687	2,200	20%	0.90	2,095	24%	0.91	2	---	---	---	---	---	---	---	57.5	22.4	D	C					
FSEB4	---	---	---	---	---	---	---	---	---	---	1,926	24%	0.91	2	Level	1.00	12	6	0.67	73.1	1,185	74.6	15.9	FS	B					
MEB2	687	20%	0.90	800	35	Up/Off	169	2,200	29%	0.90	1,926	24%	0.91	2	---	---	---	---	---	---	---	60.0	25.1	M	C					
FSEB5	---	---	---	---	---	---	---	---	---	---	2,613	24%	0.91	2	Level	1.00	12	6	0.67	73.1	1,608	71.0	22.7	FS	C					
DEB3	186	10%	0.92	1,200	35	Down/On	500	3,500	10%	0.92	2,613	24%	0.91	2	---	---	---	---	---	---	---	57.5	21.1	D	C					
FSEB6	---	---	---	---	---	---	---	---	---	---	2,427	24%	0.91	2	Level	1.00	12	6	0.67	73.1	1,494	72.3	20.7	FS	C					
MEB3	500	10%	0.92	2,000	35	Up/Off	186	3,500	10%	0.92	2,427	24%	0.91	2	---	---	---	---	---	---	---	66.0	4.7	M	A					
FSEB7	---	---	---	---	---	---	---	---	---	---	2,927	24%	0.91	2	Level	1.00	12	6	0.67	73.1	1,801	67.9	26.5	FS	D					
DEB4	185	29%	0.90	180	35	Down/On	1,105	2,900	11%	0.90	2,927	24%	0.91	3	---	---	---	---	---	---	---	57.4	23.7	D	C					
FSEB8	---	---	---	---	---	---	---	---	---	---	2,742	24%	0.91	3	Level	1.00	12	6	0.50	73.6	1,125	74.8	15.0	FS	B					
MEB4	1,105	11%	0.90	1,120	35	Up/Off	185	2,900	29%	0.90	2,742	24%	0.91	3	---	---	---	---	---	---	---	60.0	24.0	M	C					
FSEB9	---	---	---	---	---	---	---	---	---	---	3,847	24%	0.91	3	Level	1.00	12	6	1.20	71.6	1,578	68.3	23.1	FS	C					
FSWB1	---	---	---	---	---	---	---	---	---	---	3,937	22%	0.92	3	Level	1.00	12	6	1.33	71.3	1,583	68.3	23.2	FS	C					
DWB1	194	10%	0.90	150	35	Down/Off	404	920	10%	0.90	3,937	22%	0.92	3	---	---	---	---	---	---	---	57.4	29.4	D	D					
FSWB2	---	---	---	---	---	---	---	---	---	---	3,743	22%	0.92	3	Level	1.00	12	6	0.67	73.1	1,505	72.2	20.9	FS	C					
DWB1.1	404	10%	0.90	850	35	Down/On	193	750	11%	0.90	3,743	22%	0.92	3	---	---	---	---	---	---	---	56.8	22.4	D	C					
FSWB2.1	---	---	---	---	---	---	---	---	---	---	3,339	22%	0.92	3	Level	1.00	12	6	0.67	73.1	1,343	73.7	18.2	FS	C					
MWB1	193	11%	0.90	1,650	35	Up/Off	404	750	10%	0.90	3,339	22%	0.92	3	---	---	---	---	---	---	---	62.0	16.7	M	B					
FSWB3	---	---	---	---	---	---	---	---	---	---	3,532	22%	0.92	2	Level	1.00	12	6	0.83	72.6	2,131	60.8	35.0	FS	E					
DWB2	743	10%	0.92	3,000	35	Down/On	125	2,400	10%	0.92	3,532	22%	0.92	2	---	---	---	---	---	---	---	55.9	0.4	D	A					
FSWB4	---	---	---	---	---	---	---	---	---	---	2,789	22%	0.92	2	Level	1.00	12	6	0.67	73.1	1,682	69.9	24.1	FS	C					
MWB2	125	10%	0.92	1,800	35	Up/Off	743	2,400	10%	0.92	2,789	22%	0.92	2	---	---	---	---	---	---	---	60.0	23.4	M	C					
FSWB5	---	---	---	---	---	---	---	---	---	---	2,914	22%	0.92	2	Level	1.00	12	6	0.67	73.1	1,758	68.6	25.6	FS	C					
DWB3	514	27%	0.94	500	35	Down/On	167	2,200	25%	0.90	2,914	22%	0.92	2	---	---	---	---	---	---	---	56.5	30.0	D	D					
FSWB6	---	---	---	---	---	---	---	---	---	---	2,400	22%	0.92	2	Level	1.00	12	6	0.67	73.1	1,448	72.8	19.9	FS	C					
MWB3	167	25%	0.90	900	35	Up/Off	514	2,200	27%	0.94	2,400	22%	0.92	2	---	---	---	---	---	---	---	60.0	23.6	M	C					
FSWB7	---	---	---	---	---	---	---	---	---	---	2,567	22%	0.92	2	Level	1.00	12	6	0.00	75.4	1,549	71.7	21.6	FS	C					
DWB4	192	46%	0.90	475	35	Down/On	66	1,850	36%	0.92	2,567	22%	0.92	2	---	---	---	---	---	---	---	57.4	26.6	D	C					
FSWB8	---	---	---	---	---	---	---	---	---	---	2,375	22%	0.92	2	Level	1.00	12	6	0.33	74.1	1,433	72.9	19.7	FS	C					
MWB4	66	36%	0.92	800	35	Up/Off	192	1,850	46%	0.90	2,375	22%	0.92	2	---	---	---	---	---	---	---	60.0	23.4	M	C					
FSWB9	---	---	---	---	---	---	---	---	---	---	2,441	22%	0.92	2	Level	1.00	12	6	1.00	72.2	1,473	69.1	21.3	FS	C					
Two-Lane Side-Street Section	Segment Information																		HCM Results											
	Terrain	SW (ft)	LW (ft)	Seg. Length (mi)**	PHF	Truck/ Bus %	Rec. Veh %***	% NPZ	Access Point Density	Analysis Direction Volume	Opposing Direction Volume	BFFS (mph)	FFS (mph)						V/C Ratio	PTSF	Average Speed (mph)	PFFS	Hwy Class	LOS						
TLNB1	Level	2.5	11.5	1.0	0.93	11%	0%	100%	14	451	719	50	43.5	Intentionally Left Blank					0.29	65.0%	32.3	74.3%	III	D						
TLSB1	Level	2.5	11.5	1.0	0.93	11%	0%	100%	14	719	451	50	43.5						0.46	84.2%	31.3	72.0%	III	D						
TLNB2	Level	2.5	11.5	1.0	0.94	11%	0%	60%	14	994	683	50	43.5						0.62	89.1%	28.6	65.8%	III	E						
TLSB2	Level	2.5	11.5	1.0	0.94	11%	0%	60%	14	683	994	50	43.5						0.43	76.9%	29.0	66.7%	III	E						
TLNB3	Level	6.0	12.0	1.0	0.92	10%	0%	20%	8	928	625	50	48.0						0.59	85.2%	34.4	71.7%	III	D						
TLSB3	Level	6.0	12.0	1.0	0.92	10%	0%	20%	8	625	928	50	48.0						0.40	73.0%	34.5	71.8%	III	D						
TLNB4	Level	1.0	12.0	1.0	0.93	16%	0%	100%	30	549	500	55	43.3						0.35	86.3%	32.3	74.7%	III	D						
TLSB4	Level	1.0	12.0	1.0	0.93	16%	0%	100%	30	500																				

LOS	Density (pc/mi/ln)		PFFS (%)	Delay (s/veh)		<div>I-26 Widening (MM 187 - MM 194)</div> <div>2043 No Build PM Peak Hour - HCM Analysis Results</div> <div>Performance Measures</div> <div><div><div><div></div><div>Stantec</div></div><div>November, 2018</div></div></div> <th colspan="6">Notes:</th>																			Notes:					
	M or D	FS	CLASS III HWY	TWSC	SIGNAL																				FS = Freeway Segment	M = Merge Area	D = Diverge Area	TL = Two-Lane Segment	TWSC = Two-Way Stop Control	SIGNAL = Signalized Intersection
A	≤ 10	≤ 11	> 91.7	≤ 10	≤ 10																									
B	>10-20	>11-18	> 83.3 - 91.7	> 10-15	> 10-20																									
C	>20-28	>18-26	> 75.0 - 83.3	> 15-25	> 20-35																									
D	>28-35	>26-35	> 66.7 - 75.0	> 25-35	> 35-55																									
E	>35	>35-45	≤ 66.7	> 35-50	> 55-80																									
F	---	> 45	---	> 50	> 80																									
I-26 Section	Ramp Information										Mainline Information										HCM Results									
	Volume (veh/hr)	% HV	PHF	Length A/D lane (ft)	FFS**** (MPH)	Adj. Ramp Up/Down	Adj. Ramp Volume (veh/hr)	Adj. Ramp Distance (ft)	Adj. Ramp HV%	Adj. Ramp PHF	Volume (veh/hr)	% HV	PHF	No. of Lanes	Terrain	Driver Pop Factor	LW (ft)	LC (ft)	TRD (ramp/mi)	FFS (mph)	Flow Rate (pc/h/ln)	Average Speed (mph)	Density (pc/mi/ln)	Type	LOS					
FSEB1	---	---	---	---	---	---	---	---	---	---	2,617	10%	0.92	2	Level	1.00	12	6	1.00	72.2	1,493	69.0	21.6	FS	C					
DEB1	37	52%	0.90	465	35	Down/On	194	1,850	24%	0.90	2,617	10%	0.92	2	---	---	---	---	---	---	---	57.9	25.8	D	C					
FSEB2	---	---	---	---	---	---	---	---	---	---	2,580	10%	0.92	2	Level	1.00	12	6	0.33	74.1	1,472	72.5	20.3	FS	C					
MEB1	194	24%	0.90	800	35	Up/Off	37	1,850	52%	0.90	2,580	10%	0.92	2	---	---	---	---	---	---	---	60.0	25.2	M	C					
FSEB3	---	---	---	---	---	---	---	---	---	---	2,774	10%	0.92	2	Level	1.00	12	6	0.00	75.4	1,583	71.2	22.2	FS	C					
DEB2	191	14%	0.90	450	35	Down/On	703	2,200	9%	0.90	2,774	10%	0.92	2	---	---	---	---	---	---	---	57.5	27.4	D	C					
FSEB4	---	---	---	---	---	---	---	---	---	---	2,583	10%	0.92	2	Level	1.00	12	6	0.67	73.1	1,474	72.5	20.3	FS	C					
MEB2	703	9%	0.90	800	35	Up/Off	191	2,200	14%	0.90	2,583	10%	0.92	2	---	---	---	---	---	---	---	58.0	29.4	M	D					
FSEB5	---	---	---	---	---	---	---	---	---	---	3,286	10%	0.92	2	Level	1.00	12	6	0.67	73.1	1,875	66.5	28.2	FS	D					
DEB3	86	10%	0.92	1,200	35	Down/On	623	3,500	10%	0.92	3,286	10%	0.92	2	---	---	---	---	---	---	---	57.8	25.7	D	C					
FSEB6	---	---	---	---	---	---	---	---	---	---	3,200	10%	0.92	2	Level	1.00	12	6	0.67	73.1	1,826	57.4	27.1	FS	D					
MEB3	623	10%	0.92	2,000	35	Up/Off	86	3,500	10%	0.92	3,200	10%	0.92	2	---	---	---	---	---	---	---	61.0	11.0	M	B					
FSEB7	---	---	---	---	---	---	---	---	---	---	3,823	10%	0.92	2	Level	1.00	12	6	0.67	73.1	2,182	59.5	36.7	FS	E					
DEB4	202	19%	0.91	180	35	Down/On	824	2,900	7%	0.90	3,823	10%	0.92	3	---	---	---	---	---	---	---	57.4	27.4	D	C					
FSEB8	---	---	---	---	---	---	---	---	---	---	3,621	10%	0.92	3	Level	1.00	12	6	0.50	73.6	1,378	73.4	18.8	FS	C					
MEB4	824	7%	0.90	1,120	35	Up/Off	202	2,900	19%	0.91	3,621	10%	0.92	3	---	---	---	---	---	---	---	60.0	25.0	M	C					
FSEB9	---	---	---	---	---	---	---	---	---	---	4,445	10%	0.92	3	Level	1.00	12	6	1.20	71.6	1,691	67.2	25.2	FS	C					
FSWB1	---	---	---	---	---	---	---	---	---	---	5,187	15%	0.93	3	Level	1.00	12	6	1.33	71.3	1,999	62.6	31.9	FS	D					
DWB1	355	6%	0.95	150	35	Down/Off	802	920	6%	0.95	5,187	15%	0.93	3	---	---	---	---	---	---	---	57.0	35.5	D	E					
FSWB2	---	---	---	---	---	---	---	---	---	---	4,832	15%	0.93	3	Level	1.00	12	6	0.67	73.1	1,862	66.8	27.9	FS	D					
DWB1.1	802	6%	0.95	850	35	Down/On	198	750	7%	0.90	4,832	15%	0.93	3	---	---	---	---	---	---	---	55.8	27.6	D	C					
FSWB2.1	---	---	---	---	---	---	---	---	---	---	4,030	15%	0.93	3	Level	1.00	12	6	0.67	73.1	1,553	71.6	21.7	FS	C					
MWB1	198	7%	0.90	1,650	35	Up/Off	808	750	6%	0.95	4,030	15%	0.93	3	---	---	---	---	---	---	---	62.0	19.4	M	B					
FSWB3	---	---	---	---	---	---	---	---	---	---	4,228	15%	0.93	2	Level	1.00	12	6	0.67	73.1	2,444	51.9	47.1	FS	F					
DWB2	347	10%	0.92	3,000	35	Down/On	156	2,400	10%	0.92	4,228	15%	0.93	2	---	---	---	---	---	---	---	57.0	V/C > 1	D	F					
FSWB4	---	---	---	---	---	---	---	---	---	---	3,881	15%	0.93	2	Level	1.00	12	6	0.67	73.1	2,243	57.9	38.7	FS	E					
MWB2	156	10%	0.92	1,800	35	Up/Off	347	2,400	10%	0.92	3,881	15%	0.93	2	---	---	---	---	---	---	---	52.0	32.4	M	D					
FSWB5	---	---	---	---	---	---	---	---	---	---	4,037	15%	0.93	2	Level	1.00	12	6	0.67	73.1	2,333	55.3	42.2	FS	E					
DWB3	689	10%	0.91	500	35	Down/On	218	2,200	13%	0.90	4,037	15%	0.93	2	---	---	---	---	---	---	---	56.0	39.9	D	E					
FSWB6	---	---	---	---	---	---	---	---	---	---	3,348	15%	0.93	2	Level	1.00	12	6	0.67	73.1	1,935	65.3	29.6	FS	D					
MWB3	218	13%	0.90	900	35	Up/Off	689	2,200	10%	0.91	3,348	15%	0.93	2	---	---	---	---	---	---	---	56.0	31.6	M	D					
FSWB7	---	---	---	---	---	---	---	---	---	---	3,566	15%	0.93	2	Level	1.00	12	6	0.00	75.4	2,061	62.5	33.0	FS	D					
DWB4	198	21%	0.90	475	35	Down/On	69	1,850	24%	0.90	3,566	15%	0.93	2	---	---	---	---	---	---	---	57.4	35.3	D	E					
FSWB8	---	---	---	---	---	---	---	---	---	---	3,368	15%	0.93	2	Level	1.00	12	6	0.33	74.1	1,947	65.1	29.9	FS	D					
MWB4	69	24%	0.90	800	35	Up/Off	198	1,850	21%	0.90	3,368	15%	0.93	2	---	---	---	---	---	---	---	57.0	31.5	M	D					
FSWB9	---	---	---	---	---	---	---	---	---	---	3,437	15%	0.93	2	Level	1.00	12	6	1.00	72.2	1,986	62.8	31.6	FS	D					
Two-Lane Side-Street Section	Segment Information																		HCM Results											
	Terrain	SW (ft)	LW (ft)	Seg. Length (mi)**	PHF	Truck/ Bus %	Rec. Veh %***	% NPZ	Access Point Density	Analysis Direction Volume	Opposing Direction Volume	BFFS (mph)	FFS (mph)						V/C Ratio	PTSF	Average Speed (mph)	PFFS	Hwy Class	LOS						
TLNB1	Level	2.5	11.5	1.0	0.95	7%	0%	100%	14	718	521	50	43.5	Intentionally Left Blank					0.45	82.4%	31.3	71.9%	III	D						
TLSB1	Level	2.5	11.5	1.0	0.95	7%	0%	100%	14	521	718	50	43.5						0.33	69.6%	32.0	73.5%	III	D						
TLNB2	Level	2.5	11.5	1.0	0.92	7%	0%	60%	14	877	1,069	50	43.5						0.56	85.3%	26.5	60.9%	III	E						
TLSB2	Level	2.5	11.5	1.0	0.92	7%	0%	60%	14	1,069	877	50	43.5						0.68	89.8%	26.4	60.8%	III	E						
TLNB3	Level	6.0	12.0	1.0	0.92	10%	0%	20%	8	433	779	50	48.0						0.28	60.2%	37.3	77.7%	III	C						
TLSB3	Level	6.0	12.0	1.0	0.92	10%	0%	20%	8	779	433	50	48.0						0.50	80.2%	36.8	76.7%	III	C						
TLNB4	Level	1.0	12.0	1.0	0.90	7%	0%	100%	30	597	769	55	43.3						0.39	75.4%	30.3	70.0%	III	D						
TLSB4	Level	1.0	12.0	1.0	0.90	7%	0%	100%	30	769	597	55	4																	

2043 NO BUILD AM PEAK HOUR
HIGHWAY CAPACITY MANUAL ANALYSIS RESULTS

LOS	Density (pc/mi/ln)		PFFS (%)	Delay (s/veh)	
	M or D	FS	CLASS III	TWSC	SIGNAL
A	≤ 10	≤ 11	> 91.7	≤ 10-15	≤ 10-20
B	>10-20	>11-18	> 83.3 - 91.7	> 10-15	> 20-35
C	>20-28	>18-26	> 75.0 - 83.3	> 25-35	> 35-55
D	>28-35	>26-35	> 66.7 - 75.0	> 35-50	> 55-80
E	>35	>35-45	≤ 66.7	> 50	> 80
F	---	> 45	---	> 50	> 80
Symbol					

- FREEWAY SEGMENT
- DIVERGE
- MERGE
- CLASS I TWO-LANE HWY
- CLASS II TWO-LANE-HWY
- CLASS III TWO-LANE HWY
- TWSC INTERSECTION
- SIGNALIZED INTERSECTION



2043 NO BUILD PM PEAK HOUR
HIGHWAY CAPACITY MANUAL ANALYSIS RESULTS

LOS	Density (pc/mi/ln)		PFFS (%)	Delay (s/veh)	
	M or D	FS	CLASS III	TWSC	SIGNAL
A	≤ 10	≤ 11	> 91.7	≤ 10	≤ 10
B	>10-20	>11-18	> 83.3 - 91.7	> 10-15	> 10-20
C	>20-28	>18-26	> 75.0 - 83.3	> 15-25	> 20-35
D	>28-35	>26-35	> 66.7 - 75.0	> 25-35	> 35-55
E	>35	>35-45	≤ 66.7	> 35-50	> 55-80
F	---	> 45	---	> 50	> 80
Symbol					

FREEWAY SEGMENT

DIVERGE

MERGE

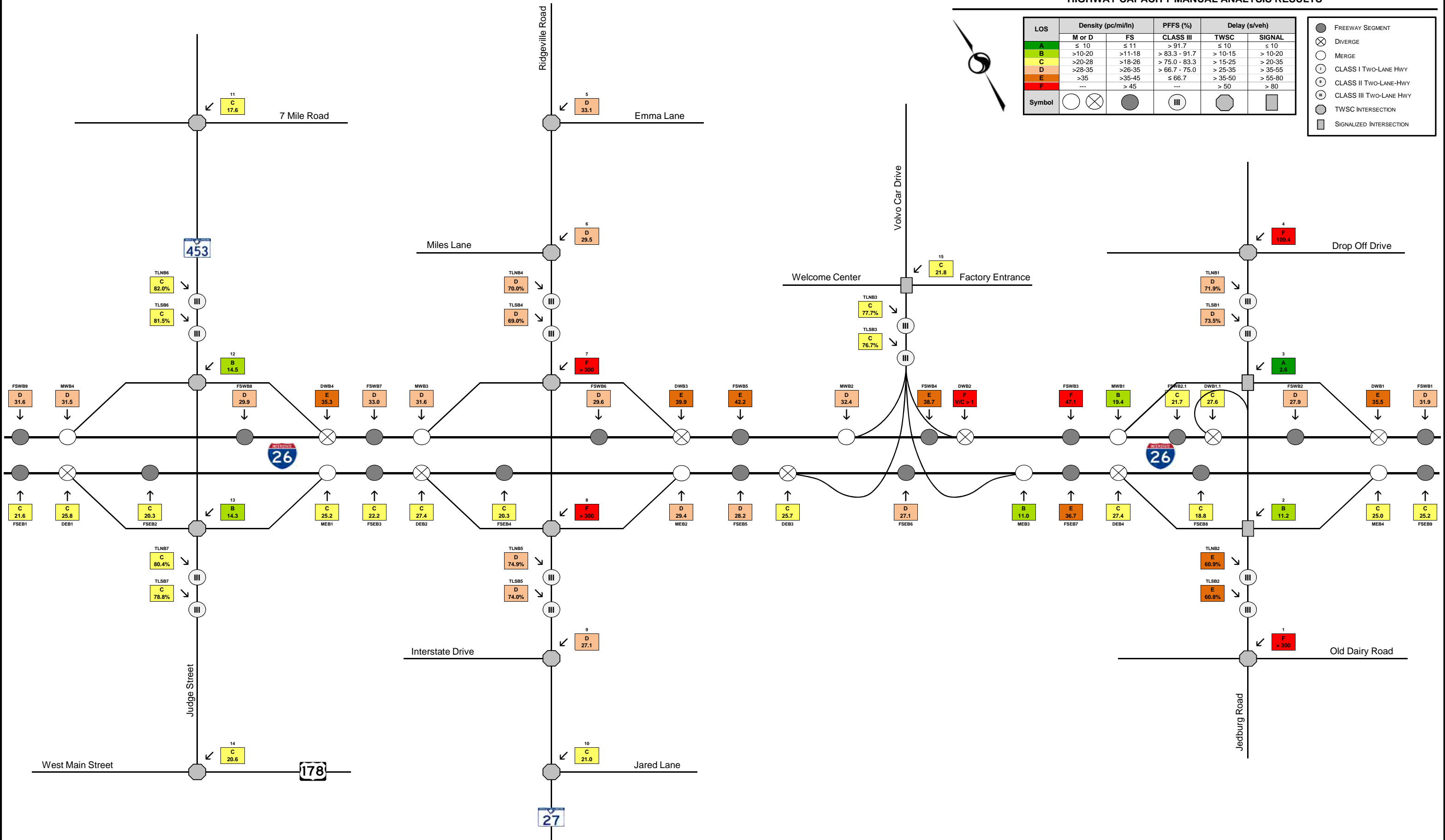
CLASS I TWO-LANE HWY

CLASS II TWO-LANE-HWY

CLASS III TWO-LANE HWY

TWSC INTERSECTION

SIGNALIZED INTERSECTION



I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

June 2019

B.4 2023 BUILD – ALTERNATIVE 1



LOS	Density (pc/mi/ln)		PFFS (%)	Delay (s/veh)		I-26 Widening (MM 187 - MM 194) 2023 Build Alt 1 (Diamond) AM Peak Hour - HCM Analysis Results Performance Measures <div><div><div><div><div><div></div><div>Stantec</div></div></div><div><div></div><div>December, 2018</div></div></div></div></div>																		Notes:						
	M or D	FS	CLASS III HWY	TWSC	SIGNAL																			FS	=	Freeway Segment	M	=	Merge Area	D
A	≤ 10	≤ 11	> 91.7	≤ 10	≤ 10																									
B	>10-20	>11-18	> 83.3 - 91.7	> 10-15	> 10-20																									
C	>20-28	>18-26	> 75.0 - 83.3	> 15-25	> 20-35																									
D	>28-35	>26-35	> 66.7 - 75.0	> 25-35	> 35-55																									
E	>35	>35-45	≤ 66.7	> 35-50	> 55-80																									
F	---	> 45	---	> 50	> 80																									
I-26 Section	Ramp Information										Mainline Information										HCM Results									
	Volume (veh/hr)	% HV	PHF	Length A/D lane (ft)	FFS**** (MPH)	Adj. Ramp Up/Down	Adj. Ramp Volume (veh/hr)	Adj. Ramp Distance (ft)	Adj. Ramp HV%	Adj. Ramp PHF	Volume (veh/hr)	% HV	PHF	No. of Lanes	Terrain	Driver Pop Factor	LW (ft)	LC (ft)	TRD (ramp/mi)	FFS (mph)	Flow Rate (pc/h/ln)	Average Speed (mph)	Density (pc/mi/ln)	Type	LOS					
FSEB1	---	---	---	---	---	---	---	---	---	---	1,525	24%	0.91	2	Level	1.00	12	6	1.00	72.2	938	70.0	13.4	FS	B					
DEB1	55	53%	0.95	465	35	Down/On	142	1,850	36%	0.90	1,525	24%	0.91	2	---	---	---	---	---	---	---	57.8	16.2	D	B					
FSEB2	---	---	---	---	---	---	---	---	---	---	1,470	24%	0.91	2	Level	1.00	12	6	0.33	74.1	905	75.0	12.1	FS	B					
MEB1	142	36%	0.90	800	35	Up/Off	55	1,850	53%	0.95	1,470	24%	0.91	2	---	---	---	---	---	---	---	65.0	15.9	M	B					
FSEB3	---	---	---	---	---	---	---	---	---	---	1,612	24%	0.91	2	Level	1.00	12	6	0.00	75.4	992	75.0	13.2	FS	B					
DEB2	119	23%	0.90	250	35	Down/On	507	4,000	16%	0.90	1,612	24%	0.91	3	---	---	---	---	---	---	---	57.6	14.4	D	B					
FSEB4	---	---	---	---	---	---	---	---	---	---	1,493	24%	0.91	3	Level	1.00	12	6	0.67	73.1	613	75.0	8.2	FS	A					
MEB2	507	16%	0.90	900	35	Up/Off	119	4,000	23%	0.90	1,493	24%	0.91	3	---	---	---	---	---	---	---	62.0	12.9	M	B					
FSEB5	---	---	---	---	---	---	---	---	---	---	2,000	24%	0.91	3	Level	1.00	12	6	0.67	73.1	821	75.0	10.9	FS	A					
DEB3	98	10%	0.92	1,200	35	Down/On	89	3,500	10%	0.92	2,000	24%	0.91	3	---	---	---	---	---	---	---	57.7	8.4	D	A					
FSEB6	---	---	---	---	---	---	---	---	---	---	1,902	24%	0.91	3	Level	1.00	12	6	0.67	73.1	780	75.0	10.4	FS	A					
MEB3	89	10%	0.92	2,000	35	Up/Off	98	3,500	10%	0.92	1,902	24%	0.91	3	---	---	---	---	---	---	---	69.0	0.0	M	A					
FSEB7	---	---	---	---	---	---	---	---	---	---	1,991	24%	0.91	3	Level	1.00	12	6	0.67	73.1	817	75.0	10.9	FS	A					
DEB4	145	29%	0.90	180	35	Down/On	864	2,900	11%	0.90	1,991	24%	0.91	3	---	---	---	---	---	---	---	57.6	17.7	D	B					
FSEB8	---	---	---	---	---	---	---	---	---	---	1,846	24%	0.91	3	Level	1.00	12	6	0.50	73.6	757	75.0	10.1	FS	A					
MEB4	864	11%	0.90	1,120	35	Up/Off	145	2,900	29%	0.90	1,846	24%	0.91	3	---	---	---	---	---	---	---	62.0	16.7	M	B					
FSEB9	---	---	---	---	---	---	---	---	---	---	2,710	24%	0.91	3	Level	1.00	12	6	1.20	71.6	1,112	70.0	15.9	FS	B					
FSWB1	---	---	---	---	---	---	---	---	---	---	2,902	22%	0.92	3	Level	1.00	12	6	1.33	71.3	1,167	70.0	16.7	FS	B					
DWB1	152	10%	0.90	150	35	Down/Off	316	920	10%	0.90	2,902	22%	0.92	3	---	---	---	---	---	---	---	57.6	23.4	D	C					
FSWB2	---	---	---	---	---	---	---	---	---	---	2,750	22%	0.92	3	Level	1.00	12	6	0.67	73.1	1,106	75.0	14.8	FS	B					
DWB1.1	316	10%	0.90	850	35	Down/On	151	750	11%	0.90	2,750	22%	0.92	3	---	---	---	---	---	---	---	57.1	16.5	D	B					
FSWB2.1	---	---	---	---	---	---	---	---	---	---	2,434	22%	0.92	3	Level	1.00	12	6	0.67	73.1	979	75.0	13.1	FS	B					
MWB1	151	11%	0.90	1,650	35	Up/Off	316	750	10%	0.90	2,434	22%	0.92	3	---	---	---	---	---	---	---	63.0	11.5	M	B					
FSWB3	---	---	---	---	---	---	---	---	---	---	2,585	22%	0.92	3	Level	1.00	12	6	0.83	72.6	1,040	75.0	13.9	FS	B					
DWB2	394	10%	0.92	3,000	35	Down/On	23	2,400	10%	0.92	2,585	22%	0.92	3	---	---	---	---	---	---	---	56.9	0.0	D	A					
FSWB4	---	---	---	---	---	---	---	---	---	---	2,191	22%	0.92	3	Level	1.00	12	6	0.67	73.1	881	75.0	11.7	FS	B					
MWB2	23	10%	0.92	1,800	35	Up/Off	394	2,400	10%	0.92	2,191	22%	0.92	3	---	---	---	---	---	---	---	63.0	9.0	M	A					
FSWB5	---	---	---	---	---	---	---	---	---	---	2,214	22%	0.92	3	Level	1.00	12	6	0.67	73.1	890	75.0	11.9	FS	B					
DWB3	376	25%	0.94	250	35	Down/On	117	3,300	16%	0.90	2,214	22%	0.92	3	---	---	---	---	---	---	---	56.9	18.7	D	B					
FSWB6	---	---	---	---	---	---	---	---	---	---	1,838	22%	0.92	3	Level	1.00	12	6	0.67	73.1	739	75.0	9.9	FS	A					
MWB3	117	16%	0.90	900	35	Up/Off	376	3,300	25%	0.94	1,838	22%	0.92	3	---	---	---	---	---	---	---	62.0	11.3	M	B					
FSWB7	---	---	---	---	---	---	---	---	---	---	1,955	22%	0.92	2	Level	1.00	12	6	0.00	75.4	1,179	74.6	15.8	FS	B					
DWB4	161	46%	0.90	475	35	Down/On	54	1,850	36%	0.92	1,955	22%	0.92	2	---	---	---	---	---	---	---	57.5	20.3	D	C					
FSWB8	---	---	---	---	---	---	---	---	---	---	1,794	22%	0.92	2	Level	1.00	12	6	0.33	74.1	1,082	74.9	14.4	FS	B					
MWB4	54	36%	0.92	800	35	Up/Off	161	1,850	46%	0.90	1,794	22%	0.92	2	---	---	---	---	---	---	---	62.0	17.8	M	B					
FSWB9	---	---	---	---	---	---	---	---	---	---	1,898	22%	0.92	2	Level	1.00	12	6	1.00	72.2	1,145	70.0	16.4	FS	B					
Two-Lane Side-Street Section	Segment Information																		HCM Results											
	Terrain	SW (ft)	LW (ft)	Seg. Length (mi)**	PHF	Truck/ Bus %	Rec. Veh %***	% NPZ	Access Point Density	Analysis Direction Volume	Opposing Direction Volume	BFFS (mph)	FFS (mph)						V/C Ratio	PTSF	Average Speed (mph)	PFFS	Hwy Class	LOS						
TLNB1	Level	2.5	11.5	1.0	0.93	11%	0%	100%	14	352	562	50	43.5	Intentionally Left Blank					0.23	58.0%	34.0	78.1%	III	C						
TLSB1	Level	2.5	11.5	1.0	0.93	11%	0%	100%	14	562	352																			

2023 BUILD ALT 1 (DIAMOND) AM PEAK HOUR
HIGHWAY CAPACITY MANUAL ANALYSIS RESULTS

LOS	Density (pc/mi/ln)		PFFS (%)	Delay (s/veh)	
	M or D	FS	CLASS III	TWSC	SIGNAL
A	≤ 10	≤ 11	> 91.7	≤ 10	≤ 10
B	>10-20	>11-18	> 83.3 - 91.7	> 10-15	> 10-20
C	>20-28	>18-26	> 75.0 - 83.3	> 15-25	> 20-35
D	>28-35	>26-35	> 66.7 - 75.0	> 25-35	> 35-55
E	>35	>35-45	≤ 66.7	> 35-50	> 55-80
F	---	> 45	---	> 50	> 80
Symbol					

FREEWAY SEGMENT

DIVERGE

MERGE

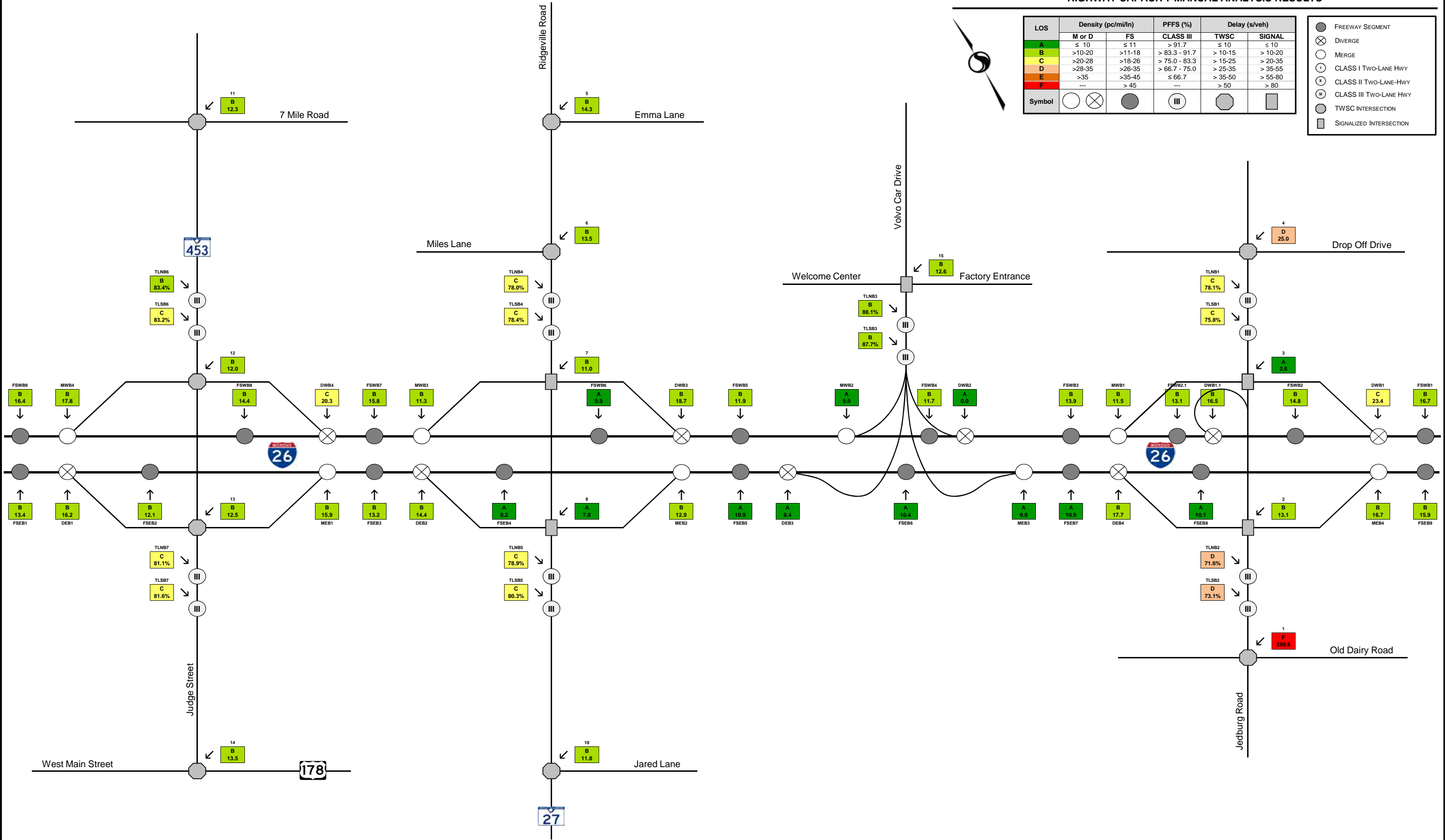
CLASS I TWO-LANE HWY

CLASS II TWO-LANE-HWY

CLASS III TWO-LANE HWY

TWSC INTERSECTION

SIGNALIZED INTERSECTION



2023 BUILD ALT 1 (DIAMOND) PM PEAK HOUR
HIGHWAY CAPACITY MANUAL ANALYSIS RESULTS

LOS

A

B

C

D

E

F

Symbol

Density (pc/mi/ln)

M or D

FS

PFFS (%)

CLASS III

Delay (s/veh)

TWSC

SIGNAL

●

FREEWAY SEGMENT

⊗

DIVERGE

○

MERGE

⊖

CLASS I TWO-LANE HWY

⊖

CLASS II TWO-LANE-HWY

⊖

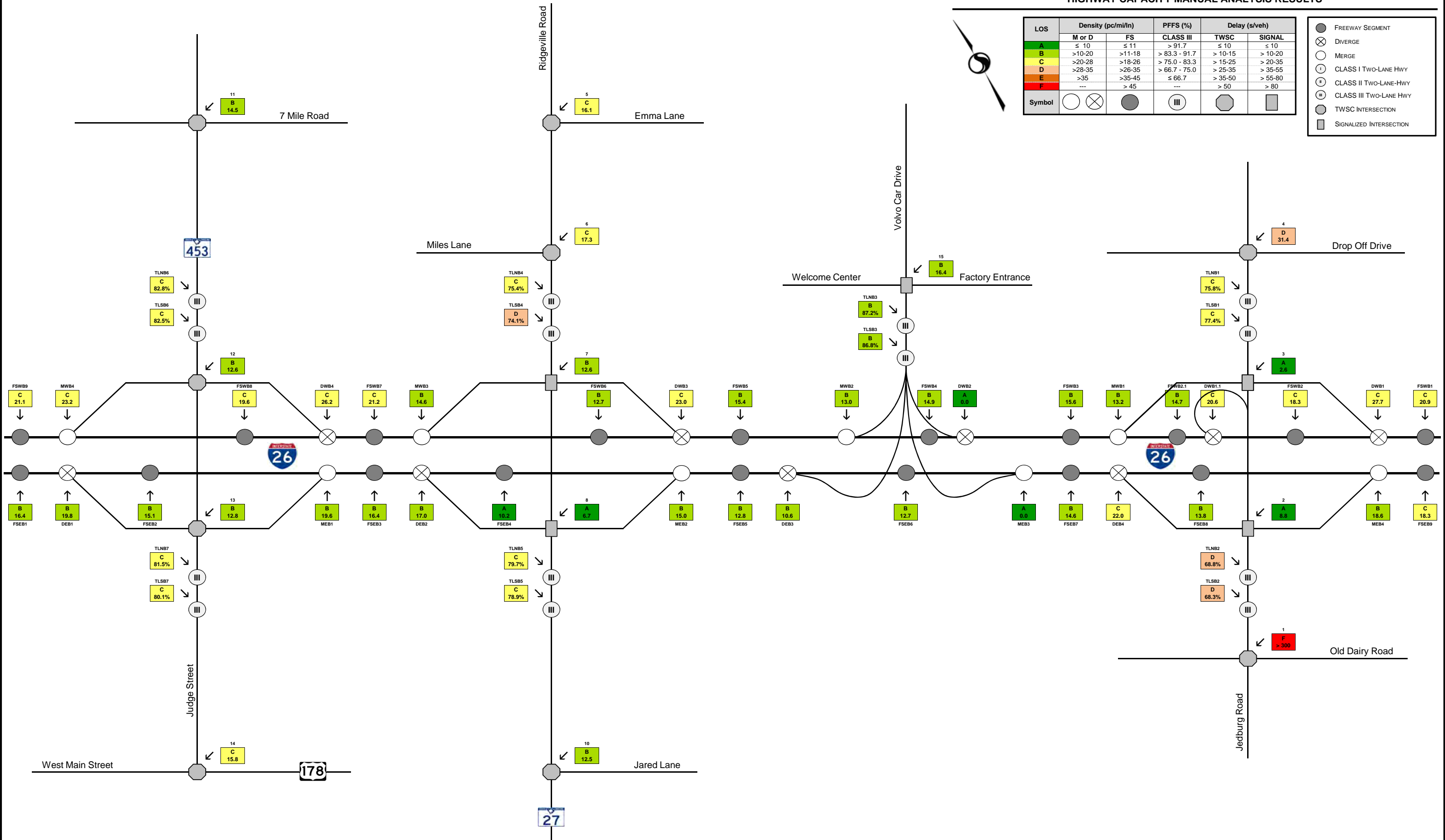
CLASS III TWO-LANE HWY

⊖

TWSC INTERSECTION

■

SIGNALIZED INTERSECTION



June 2019

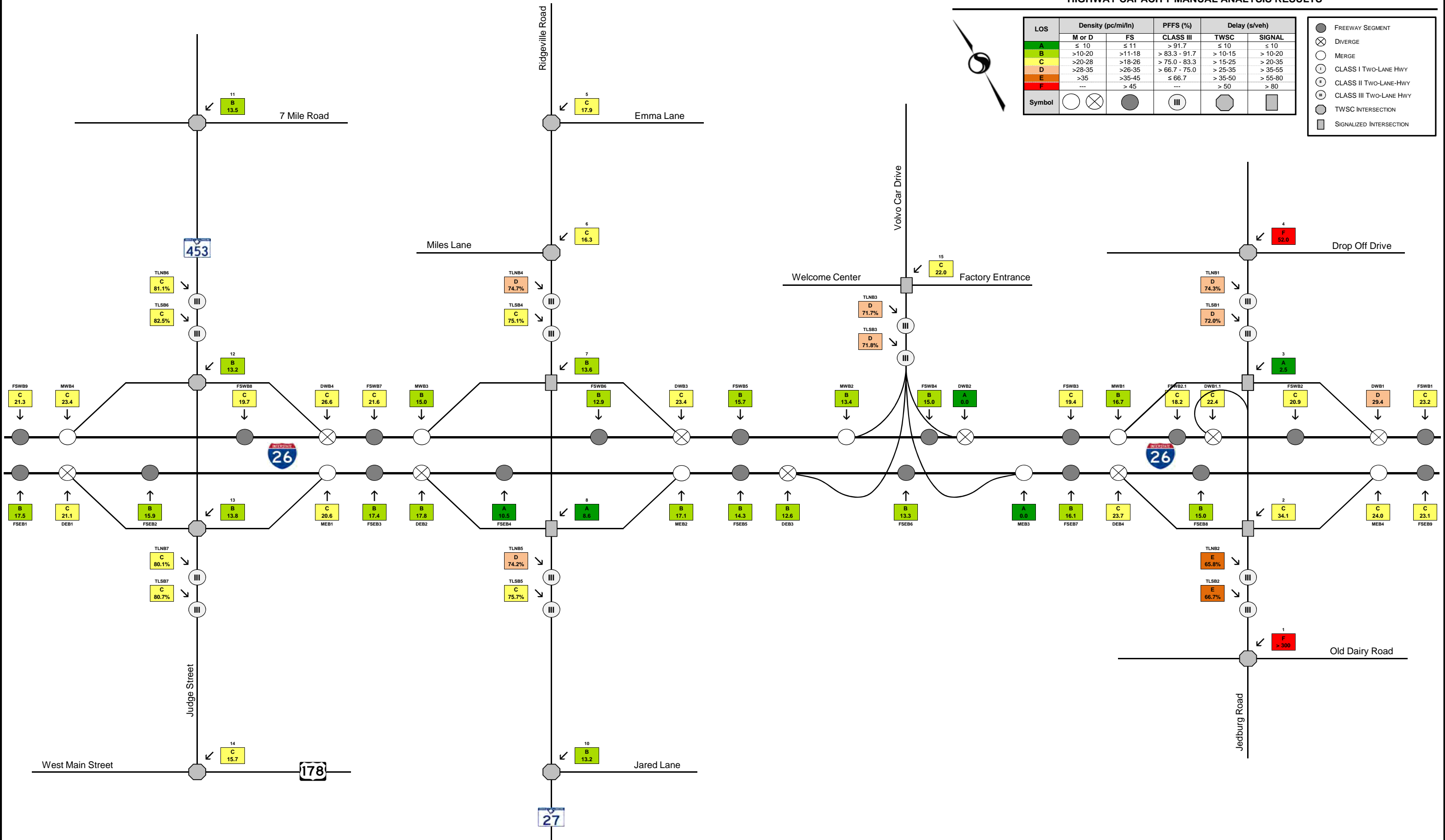
B.5 2043 BUILD – ALTERNATIVE 1



2043 BUILD ALT 1 (DIAMOND) AM PEAK HOUR
HIGHWAY CAPACITY MANUAL ANALYSIS RESULTS

LOS	Density (pc/mi/ln)		PFFS (%)	Delay (s/veh)	
	M or D	FS	CLASS III	TWSC	SIGNAL
A	≤ 10	≤ 11	> 91.7	≤ 10-15	≤ 10
B	>10-20	>11-18	> 83.3 - 91.7	> 10-15	> 10-20
C	>20-28	>18-26	> 75.0 - 83.3	> 15-25	> 20-35
D	>28-35	>26-35	> 66.7 - 75.0	> 25-35	> 35-55
E	>35	>35-45	≤ 66.7	> 35-50	> 55-80
F	---	> 45	---	> 50	> 80
Symbol					

- FREEWAY SEGMENT
- DIVERGE
- MERGE
- CLASS I TWO-LANE HWY
- CLASS II TWO-LANE-HWY
- CLASS III TWO-LANE HWY
- TWSC INTERSECTION
- SIGNALIZED INTERSECTION



2043 BUILD ALT 1 (DIAMOND) PM PEAK HOUR
HIGHWAY CAPACITY MANUAL ANALYSIS RESULTS

LOS

A

B

C

D

E

F

Symbol

Density (pc/mi/ln)

M or D

FS

PFFS (%)

CLASS III

Delay (s/veh)

TWSC

SIGNAL

FREEWAY SEGMENT

DIVERGE

MERGE

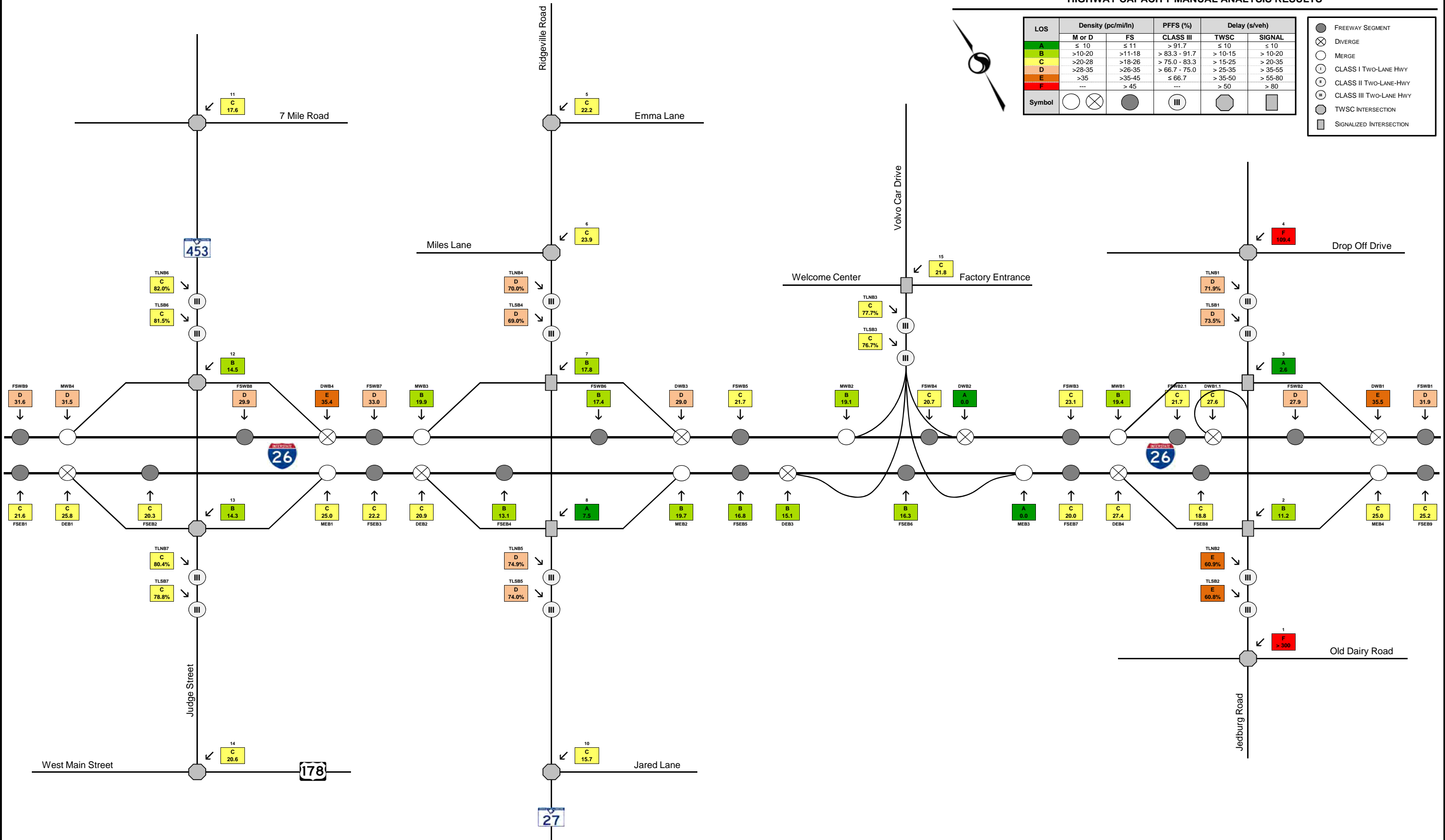
CLASS I TWO-LANE HWY

CLASS II TWO-LANE-HWY

CLASS III TWO-LANE HWY

TWSC INTERSECTION

SIGNALIZED INTERSECTION



June 2019

B.6 2023 BUILD – ALTERNATIVE 2



LOS	Density (pc/mi/ln)		PFFS (%)	Delay (s/veh)		<div>I-26 Widening (MM 187 - MM 194)</div> <div>2023 Build Alt 2 (Parclo - B) AM Peak Hour - HCM Analysis Results</div> <div>Performance Measures</div> <div><div><div><div></div><div>Stantec</div></div><div>December, 2018</div></div></div>																		Notes:						
	M or D	FS	CLASS III HWY	TWSC	SIGNAL																			FS = Freeway Segment	M = Merge Area	D = Diverge Area	TL = Two-Lane Segment	TWSC = Two-Way Stop Control	SIGNAL = Signalized Intersection	
A	≤ 10	≤ 11	> 91.7	≤ 10	≤ 10																									
B	>10-20	>11-18	> 83.3 - 91.7	> 10-15	> 10-20																									
C	>20-28	>18-26	> 75.0 - 83.3	> 15-25	> 20-35																									
D	>28-35	>26-35	> 66.7 - 75.0	> 25-35	> 35-55																									
E	>35	>35-45	≤ 66.7	> 35-50	> 55-80																									
F	---	> 45	---	> 50	> 80																									
I-26 Section	Ramp Information										Mainline Information										HCM Results									
	Volume (veh/hr)	% HV	PHF	Length A/D lane (ft)	FFS**** (MPH)	Adj. Ramp Up/Down	Adj. Ramp Volume (veh/hr)	Adj. Ramp Distance (ft)	Adj. Ramp HV%	Adj. Ramp PHF	Volume (veh/hr)	% HV	PHF	No. of Lanes	Terrain	Driver Pop Factor	LW (ft)	LC (ft)	TRD (ramp/mi)	FFS (mph)	Flow Rate (pc/h/ln)	Average Speed (mph)	Density (pc/mi/ln)	Type	LOS					
FSEB1	---	---	---	---	---	---	---	---	---	---	1,525	24%	0.91	2	Level	1.00	12	6	1.00	72.2	938	70.0	13.4	FS	B					
DEB1	55	53%	0.95	465	35	Down/On	142	1,850	36%	0.90	1,525	24%	0.91	2	---	---	---	---	---	---	---	57.8	16.2	D	B					
FSEB2	---	---	---	---	---	---	---	---	---	---	1,470	24%	0.91	2	Level	1.00	12	6	0.33	74.1	905	75.0	12.1	FS	B					
MEB1	142	36%	0.90	800	35	Up/Off	55	1,850	53%	0.95	1,470	24%	0.91	2	---	---	---	---	---	---	---	65.0	15.9	M	B					
FSEB3	---	---	---	---	---	---	---	---	---	---	1,612	24%	0.91	2	Level	1.00	12	6	0.00	75.4	992	75.0	13.2	FS	B					
DEB2	83	23%	0.90	250	35	Down/Off	36	1,600	23%	0.90	1,612	24%	0.91	3	---	---	---	---	---	---	---	57.8	14.3	D	B					
FSEB4	---	---	---	---	---	---	---	---	---	---	1,529	24%	0.91	3	Level	1.00	12	6	0.83	72.6	627	75.0	8.4	FS	A					
DEB2.1	36	23%	0.90	650	35	Down/On	507	1,450	16%	0.90	1,529	24%	0.91	3	---	---	---	---	---	---	---	57.9	10.0	D	A					
FSEB4.1	---	---	---	---	---	---	---	---	---	---	1,493	24%	0.91	3	Level	1.00	12	6	0.83	72.6	613	75.0	8.2	FS	A					
MEB2	507	16%	0.90	900	35	Up/Off	36	1,450	23%	0.90	1,493	24%	0.91	3	---	---	---	---	---	---	---	62.0	12.9	M	B					
FSEB5	---	---	---	---	---	---	---	---	---	---	2,000	24%	0.91	3	Level	1.00	12	6	0.83	72.6	821	75.0	10.9	FS	A					
DEB3	98	10%	0.92	1,200	35	Down/On	89	3,500	10%	0.92	2,000	24%	0.91	3	---	---	---	---	---	---	---	57.7	8.4	D	A					
FSEB6	---	---	---	---	---	---	---	---	---	---	1,902	24%	0.91	3	Level	1.00	12	6	0.83	72.6	780	75.0	10.4	FS	A					
MEB3	89	10%	0.92	2,000	35	Up/Off	98	3,500	10%	0.92	1,902	24%	0.91	3	---	---	---	---	---	---	---	69.0	0.0	M	A					
FSEB7	---	---	---	---	---	---	---	---	---	---	1,991	24%	0.91	3	Level	1.00	12	6	0.67	73.1	817	75.0	10.9	FS	A					
DEB4	145	29%	0.90	180	35	Down/On	864	2,900	11%	0.90	1,991	24%	0.91	3	---	---	---	---	---	---	---	57.6	17.7	D	B					
FSEB8	---	---	---	---	---	---	---	---	---	---	1,846	24%	0.91	3	Level	1.00	12	6	0.50	73.6	757	75.0	10.1	FS	A					
MEB4	864	11%	0.90	1,120	35	Up/Off	145	2,900	29%	0.90	1,846	24%	0.91	3	---	---	---	---	---	---	---	62.0	16.7	M	B					
FSEB9	---	---	---	---	---	---	---	---	---	---	2,710	24%	0.91	3	Level	1.00	12	6	1.20	71.6	1,112	70.0	15.9	FS	B					
FSWB1	---	---	---	---	---	---	---	---	---	---	2,902	22%	0.92	3	Level	1.00	12	6	1.33	71.3	1,167	70.0	16.7	FS	B					
DWB1	152	10%	0.90	150	35	Down/Off	316	920	10%	0.90	2,902	22%	0.92	3	---	---	---	---	---	---	---	57.6	23.4	D	C					
FSWB2	---	---	---	---	---	---	---	---	---	---	2,750	22%	0.92	3	Level	1.00	12	6	0.67	73.1	1,106	75.0	14.8	FS	B					
DWB1.1	316	10%	0.90	850	35	Down/On	151	750	11%	0.90	2,750	22%	0.92	3	---	---	---	---	---	---	---	57.1	16.5	D	B					
FSWB2.1	---	---	---	---	---	---	---	---	---	---	2,434	22%	0.92	3	Level	1.00	12	6	0.67	73.1	979	75.0	13.1	FS	B					
MWB1	151	11%	0.90	1,650	35	Up/Off	316	750	10%	0.90	2,434	22%	0.92	3	---	---	---	---	---	---	---	63.0	11.5	M	B					
FSWB3	---	---	---	---	---	---	---	---	---	---	2,585	22%	0.92	3	Level	1.00	12	6	0.83	72.6	1,040	75.0	13.9	FS	B					
DWB2	394	10%	0.92	3,000	35	Down/On	23	2,400	10%	0.92	2,585	22%	0.92	3	---	---	---	---	---	---	---	56.9	0.0	D	A					
FSWB4	---	---	---	---	---	---	---	---	---	---	2,191	22%	0.92	3	Level	1.00	12	6	0.83	72.6	881	75.0	11.7	FS	B					
MWB2	23	10%	0.92	1,800	35	Up/Off	394	2,400	10%	0.92	2,191	22%	0.92	3	---	---	---	---	---	---	---	63.0	9.0	M	A					
FSWB5	---	---	---	---	---	---	---	---	---	---	2,214	22%	0.92	3	Level	1.00	12	6	0.83	72.6	890	75.0	11.9	FS	B					
DWB3	202	25%	0.94	250	35	Down/Off	174	1,775	25%	0.94	2,214	22%	0.92	3	---	---	---	---	---	---	---	57.4	18.3	D	B					
FSWB6	---	---	---	---	---	---	---	---	---	---	2,012	22%	0.92	3	Level	1.00	12	6	0.83	72.6	809	75.0	10.8	FS	A					
DWB3.1	174	25%	0.94	650	35	Down/On	117	1,300	16%	0.90	2,012	22%	0.92	3	---	---	---	---	---	---	---	57.5	17.0	D	B					
FSWB6.1	---	---	---	---	---	---	---	---	---	---	1,838	22%	0.92	3	Level	1.00	12	6	0.83	72.6	739	75.0	9.9	FS	A					
MWB3	117	16%	0.90	900	35	Up/Off	174	1,300	25%	0.94	1,838	22%	0.92	3	---	---	---	---	---	---	---	62.0	11.3	M	B					
FSWB7	---	---	---	---	---	---	---	---	---	---	1,955	22%	0.92	2	Level	1.00	12	6	0.00	75.4	1,179	74.6	15.8	FS	B					
DWB4	161	46%	0.90	475	35	Down/On	54	1,850	36%	0.92	1,955	22%	0.92	2	---	---	---	---	---	---	---	57.5	20.3	D	C					
FSWB8	---	---	---	---	---	---	---	---	---	---	1,794	22%	0.92	2	Level	1.00	12	6	0.33	74.1	1,082	74.9	14.4	FS	B					
MWB4	54	36%	0.92	800	35	Up/Off	161	1,850	46%	0.90	1,794	22%	0.92	2	---	---	---	---	---	---	---	62.0	17.8	M	B					
FSWB9	---	---	---	---	---	---	---	---	---	---	1,898	22%	0.92	2	Level	1.00	12	6	1.00	72.2	1,145	70.0	16.4	FS	B					
Two-Lane Side-Street Section	Segment Information													Intentionally Left Blank					HCM Results											
	Terrain	SW (ft)	LW (ft)	Seg. Length (mi)**	PHF	Truck/ Bus %	Rec. Veh %***	% NPZ	Access Point Density	Analysis Direction Volume	Opposing Direction Volume	BFFS (mph)	FFS (mph)						V/C Ratio	PTSF	Average Speed (mph)	PFFS	Hwy Class	LOS						
TLNB1	Level	2.5	11.5	1.0	0.93	11%	0%	100%	14	352	562	50	43.5						0.23	58.0%	34.0	78.1%	III	C						
TLSB1	Level	2.5	11.5	1.0	0.93	11%	0%	100%	14																					

2023 BUILD ALT 2 (PARCLO - B) AM PEAK HOUR
HIGHWAY CAPACITY MANUAL ANALYSIS RESULTS

LOS	Density (pc/mi/ln)		PFFS (%)	Delay (s/veh)	
	M or D	FS	CLASS III	TWSC	SIGNAL
A	≤ 10	≤ 11	> 91.7	≤ 10-15	≤ 10-20
B	>10-20	>11-18	> 83.3 - 91.7	> 10-15	> 20-35
C	>20-28	>18-26	> 75.0 - 83.3	> 15-25	> 35-55
D	>28-35	>26-35	> 66.7 - 75.0	> 25-35	> 55-80
E	>35	>35-45	≤ 66.7	> 35-50	> 80
F	---	> 45	---	> 50	> 80
Symbol					

FREEWAY SEGMENT

DIVERGE

MERGE

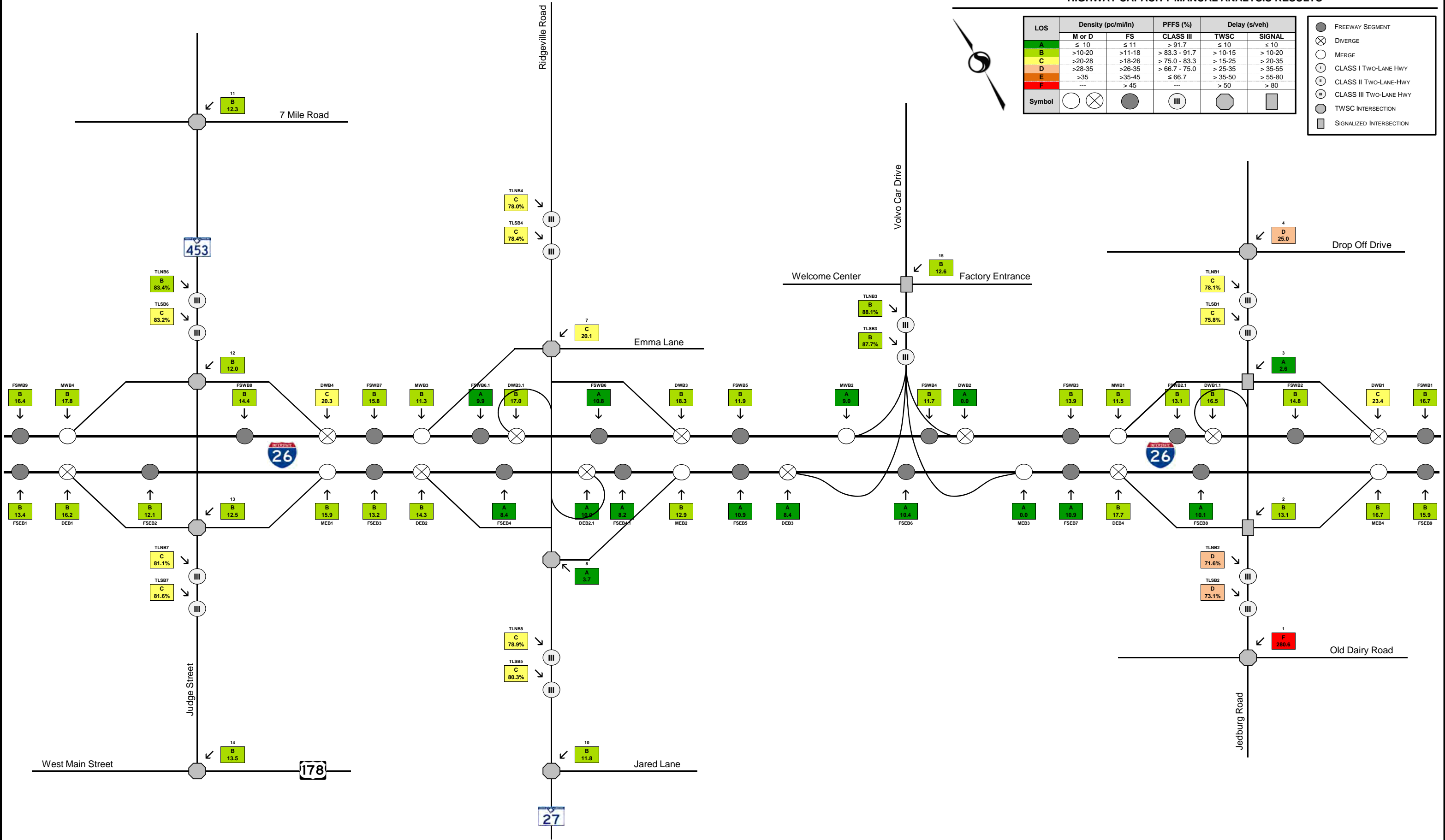
CLASS I TWO-LANE HWY

CLASS II TWO-LANE HWY

CLASS III TWO-LANE HWY

TWSC INTERSECTION

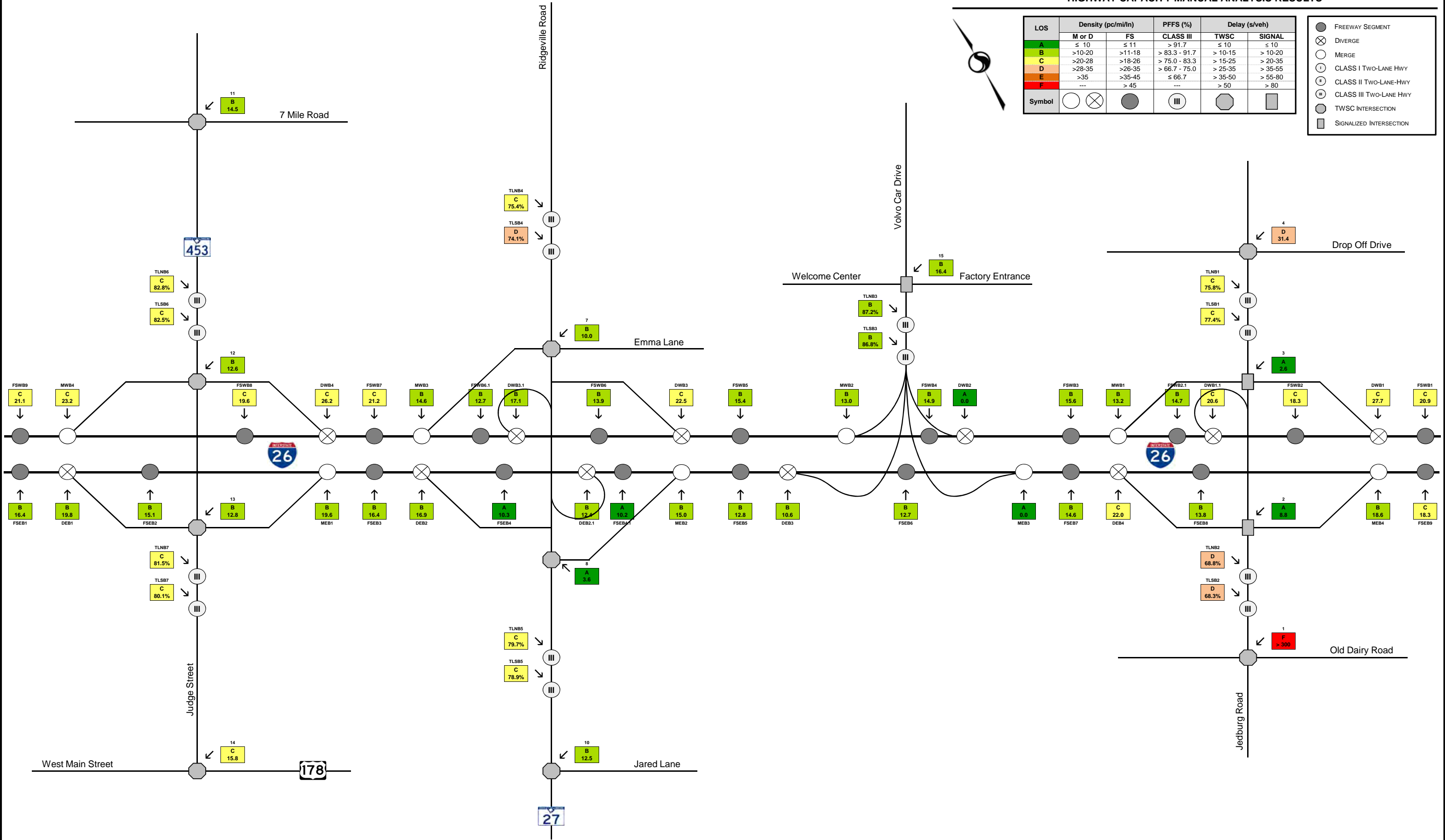
SIGNALIZED INTERSECTION



2023 BUILD ALT 2 (PARCLO - B) PM PEAK HOUR
HIGHWAY CAPACITY MANUAL ANALYSIS RESULTS

LOS	Density (pc/mi/ln)		PFFS (%)	Delay (s/veh)	
	M or D	FS	CLASS III	TWSC	SIGNAL
A	≤ 10	≤ 11	> 91.7	≤ 10-15	≤ 10-20
B	>10-20	>11-18	> 83.3 - 91.7	> 10-15	> 10-20
C	>20-28	>18-26	> 75.0 - 83.3	> 15-25	> 20-35
D	>28-35	>26-35	> 66.7 - 75.0	> 25-35	> 35-55
E	>35	>35-45	≤ 66.7	> 35-50	> 55-80
F	---	> 45	---	> 50	> 80
Symbol					

- FREEWAY SEGMENT
- DIVERGE
- MERGE
- CLASS I TWO-LANE HWY
- CLASS II TWO-LANE-HWY
- CLASS III TWO-LANE HWY
- TWSC INTERSECTION
- SIGNALIZED INTERSECTION



June 2019

B.7 2043 BUILD – ALTERNATIVE 2



LOS	Density (pc/mi/ln)		PFFS (%)	Delay (s/veh)		I-26 Widening (MM 187 - MM 194)																			Notes: FS = Freeway Segment M = Merge Area D = Diverge Area TL = Two-Lane Segment TWSC = Two-Way Stop Control SIGNAL = Signalized Intersection				
	M or D	FS	CLASS III HWY	TWSC	SIGNAL	2043 Build Alt 2 (Parclo - B) PM Peak Hour - HCM Analysis Results																							
A	≤ 10	≤ 11	> 91.7	≤ 10	≤ 10	Performance Measures																							
B	>10-20	>11-18	> 83.3 - 91.7	> 10-15	> 10-20																								
C	>20-28	>18-26	> 75.0 - 83.3	> 15-25	> 20-35																								
D	>28-35	>26-35	> 66.7 - 75.0	> 25-35	> 35-55																								
E	>35	>35-45	≤ 66.7	> 35-50	> 55-80																								
F	---	> 45	---	> 50	> 80	December, 2018																							
I-26 Section		Ramp Information										Mainline Information										HCM Results							
		Volume (veh/hr)	% HV	PHF	Length A/D lane (ft)	FFS**** (MPH)	Adj. Ramp Up/Down	Adj. Ramp Volume (veh/hr)	Adj. Ramp Distance (ft)	Adj. Ramp HV%	Adj. Ramp PHF	Volume (veh/hr)	% HV	PHF	No. of Lanes	Terrain	Driver Pop Factor	LW (ft)	LC (ft)	TRD (ramp/mi)	FFS (mph)	Flow Rate (pc/h/ln)	Average Speed (mph)	Density (pc/mi/ln)	Type	LOS			
FSEB1	---	---	---	---	---	---	---	---	---	---	2,617	10%	0.92	2	Level	1.00	12	6	1.00	72.2	1,493	69.0	21.6	FS	C				
DEB1	37	52%	0.90	465	35	Down/On	194	1,850	24%	0.90	2,617	10%	0.92	2	---	---	---	---	---	---	---	57.9	25.8	D	C				
FSEB2	---	---	---	---	---	---	---	---	---	---	2,580	10%	0.92	2	Level	1.00	12	6	0.33	74.1	1,472	72.5	20.3	FS	C				
MEB1	194	24%	0.90	800	35	Up/Off	37	1,850	52%	0.90	2,580	10%	0.92	2	---	---	---	---	---	---	---	60.0	25.2	M	C				
FSEB3	---	---	---	---	---	---	---	---	---	---	2,774	10%	0.92	2	Level	1.00	12	6	0.00	75.4	1,583	71.2	22.2	FS	C				
DEB2	161	15%	0.90	250	35	Down/Off	30	1,600	8%	0.90	2,774	10%	0.92	3	---	---	---	---	---	---	---	57.6	20.8	D	C				
FSEB4	---	---	---	---	---	---	---	---	---	---	2,613	10%	0.92	3	Level	1.00	12	6	0.83	72.6	994	75.0	13.3	FS	B				
DEB2.1	30	8%	0.90	650	35	Down/On	703	1,450	12%	0.90	2,613	10%	0.92	3	---	---	---	---	---	---	---	57.9	16.0	D	B				
FSEB4.1	---	---	---	---	---	---	---	---	---	---	2,583	10%	0.92	3	Level	1.00	12	6	0.83	72.6	983	75.0	13.1	FS	B				
MEB2	703	12%	0.90	900	35	Up/Off	30	1,450	8%	0.90	2,583	10%	0.92	3	---	---	---	---	---	---	---	61.0	19.8	M	B				
FSEB5	---	---	---	---	---	---	---	---	---	---	3,286	10%	0.92	3	Level	1.00	12	6	0.83	72.6	1,250	74.3	16.8	FS	B				
DEB3	86	10%	0.92	1,200	35	Down/On	623	3,500	10%	0.92	3,286	10%	0.92	3	---	---	---	---	---	---	---	57.8	15.1	D	B				
FSEB6	---	---	---	---	---	---	---	---	---	---	3,200	10%	0.92	3	Level	1.00	12	6	0.83	72.6	1,217	74.5	16.3	FS	B				
MEB3	623	10%	0.92	2,000	35	Up/Off	86	3,500	10%	0.92	3,200	10%	0.92	3	---	---	---	---	---	---	---	68.0	0.0	M	A				
FSEB7	---	---	---	---	---	---	---	---	---	---	3,823	10%	0.92	3	Level	1.00	12	6	0.67	73.1	1,454	72.7	20.0	FS	C				
DEB4	202	19%	0.91	180	35	Down/On	824	2,900	7%	0.90	3,823	10%	0.92	3	---	---	---	---	---	---	---	57.4	27.4	D	C				
FSEB8	---	---	---	---	---	---	---	---	---	---	3,621	10%	0.92	3	Level	1.00	12	6	0.50	73.6	1,378	73.4	18.8	FS	C				
MEB4	824	7%	0.90	1,120	35	Up/Off	202	2,900	19%	0.91	3,621	10%	0.92	3	---	---	---	---	---	---	---	60.0	25.0	M	C				
FSEB9	---	---	---	---	---	---	---	---	---	---	4,445	10%	0.92	3	Level	1.00	12	6	1.20	71.6	1,685	67.3	25.0	FS	C				
FSWB1	---	---	---	---	---	---	---	---	---	---	5,187	15%	0.93	3	Level	1.00	12	6	1.33	71.3	1,999	62.6	31.9	FS	D				
DWB1	355	6%	0.95	150	35	Down/Off	802	920	6%	0.95	5,187	15%	0.93	3	---	---	---	---	---	---	---	57.0	35.5	D	E				
FSWB2	---	---	---	---	---	---	---	---	---	---	4,832	15%	0.93	3	Level	1.00	12	6	0.67	73.1	1,862	66.8	27.9	FS	D				
DWB1.1	802	6%	0.95	850	35	Down/On	198	750	7%	0.90	4,832	15%	0.93	3	---	---	---	---	---	---	---	55.8	27.6	D	C				
FSWB2.1	---	---	---	---	---	---	---	---	---	---	4,030	15%	0.93	3	Level	1.00	12	6	0.67	73.1	1,553	71.6	21.7	FS	C				
MWB1	198	7%	0.90	1,650	35	Up/Off	808	750	6%	0.95	4,030	15%	0.93	3	---	---	---	---	---	---	---	62.0	19.4	M	B				
FSWB3	---	---	---	---	---	---	---	---	---	---	4,228	15%	0.93	3	Level	1.00	12	6	0.67	73.1	1,629	70.6	23.1	FS	C				
DWB2	347	10%	0.92	3,000	35	Down/On	156	2,400	10%	0.92	4,228	15%	0.93	3	---	---	---	---	---	---	---	57.0	0.0	D	A				
FSWB4	---	---	---	---	---	---	---	---	---	---	3,881	15%	0.93	3	Level	1.00	12	6	0.83	72.6	1,495	72.3	20.7	FS	C				
MWB2	156	10%	0.92	1,800	35	Up/Off	347	2,400	10%	0.92	3,881	15%	0.93	3	---	---	---	---	---	---	---	62.0	19.1	M	B				
FSWB5	---	---	---	---	---	---	---	---	---	---	4,037	15%	0.93	3	Level	1.00	12	6	0.83	72.6	1,555	71.6	21.7	FS	C				
DWB3	380	7%	0.91	250	35	Down/Off	309	1,775	11%	0.91	4,037	15%	0.93	3	---	---	---	---	---	---	---	56.9	28.4	D	D				
FSWB6	---	---	---	---	---	---	---	---	---	---	3,657	15%	0.93	3	Level	1.00	12	6	0.83	72.6	1,409	73.1	19.3	FS	C				
DWB3.1	309	11%	0.91	650	35	Down/On	218	1,300	11%	0.90	3,657	15%	0.93	3	---	---	---	---	---	---	---	57.2	22.7	D	C				
FSWB6.1	---	---	---	---	---	---	---	---	---	---	3,348	15%	0.93	3	Level	1.00	12	6	0.83	72.6	1,290	74.1	17.4	FS	B				
MWB3	218	11%	0.90	900	35	Up/Off	309	1,300	11%	0.91	3,348	15%	0.93	3	---	---	---	---	---	---	---	61.0	19.9	M	B				
FSWB7	---	---	---	---	---	---	---	---	---	---	3,566	15%	0.93	2	Level	1.00	12	6	0.00	75.4	2,061	62.5	33.0	FS	D				
DWB4	198	21%	0.90	475	35	Down/On	69	1,850	24%	0.90	3,566	15%	0.93	2	---	---	---	---	---	---	---	57.4	35.4	D	E				
FSWB8	---	---	---	---	---	---	---	---	---	---	3,368	15%	0.93	2	Level	1.00	12	6	0.33	74.1	1,947	65.1	29.9	FS	D				
MWB4	69	24%	0.90	800	35	Up/Off	198	1,850	21%	0.90	3,368	15%	0.93	2	---	---	---	---	---	---	---	57.0	31.5	M	D				
FSWB9	---	---	---	---	---	---	---	---	---	---	3,437	15%	0.93	2	Level	1.00	12	6	1.00	72.2	1,989	62.8	31.6	FS	D				
Two-Lane Side-Street Section	Segment Information																			HCM Results									
	Terrain	SW (ft)	LW (ft)	Seg. Length (mi)**	PHF	Truck/ Bus %	Rec. Veh %***	% NPZ	Access Point Density	Analysis Direction Volume	Opposing Direction Volume	BFFS (mph)	FFS (mph)							V/C Ratio	PTSF	Average Speed (mph)	PFFS	Hwy Class	LOS				
TLNB1	Level	2.5	11.5	1.0	0.95	7%	0%	100%	14	718	521	50	43.5	Intentionally Left Blank						0.45	82.4%	31.3	71.9%	III	D				
TLSB1	Level	2.5	11.5	1.0	0.95	7%	0%	100%	14	521	718	50	43.5							0.33	69.6%	32.0	73.5%	III	D				
TLNB2	Level	2.5	11.5	1.0	0.92	7%	0%	60%	14	877	1,069	50	43.5							0.56	85.3%	26.5	60.9%	III	E				
TLSB2	Level	2.5	11.5	1.0	0.92	7%	0%																						

2043 BUILD ALT 2 (PARCLO - B) AM PEAK HOUR
HIGHWAY CAPACITY MANUAL ANALYSIS RESULTS

LOS	Density (pc/mi/ln)		PFFS (%)	Delay (s/veh)	
	M or D	FS	CLASS III	TWSC	SIGNAL
A	≤ 10	≤ 11	> 91.7	≤ 10	≤ 10
B	>10-20	>11-18	> 83.3 - 91.7	> 10-15	> 10-20
C	>20-28	>18-26	> 75.0 - 83.3	> 15-25	> 20-35
D	>28-35	>26-35	> 66.7 - 75.0	> 25-35	> 35-55
E	>35	>35-45	≤ 66.7	> 35-50	> 55-80
F	---	> 45	---	> 50	> 80
Symbol					

FREEWAY SEGMENT

DIVERGE

MERGE

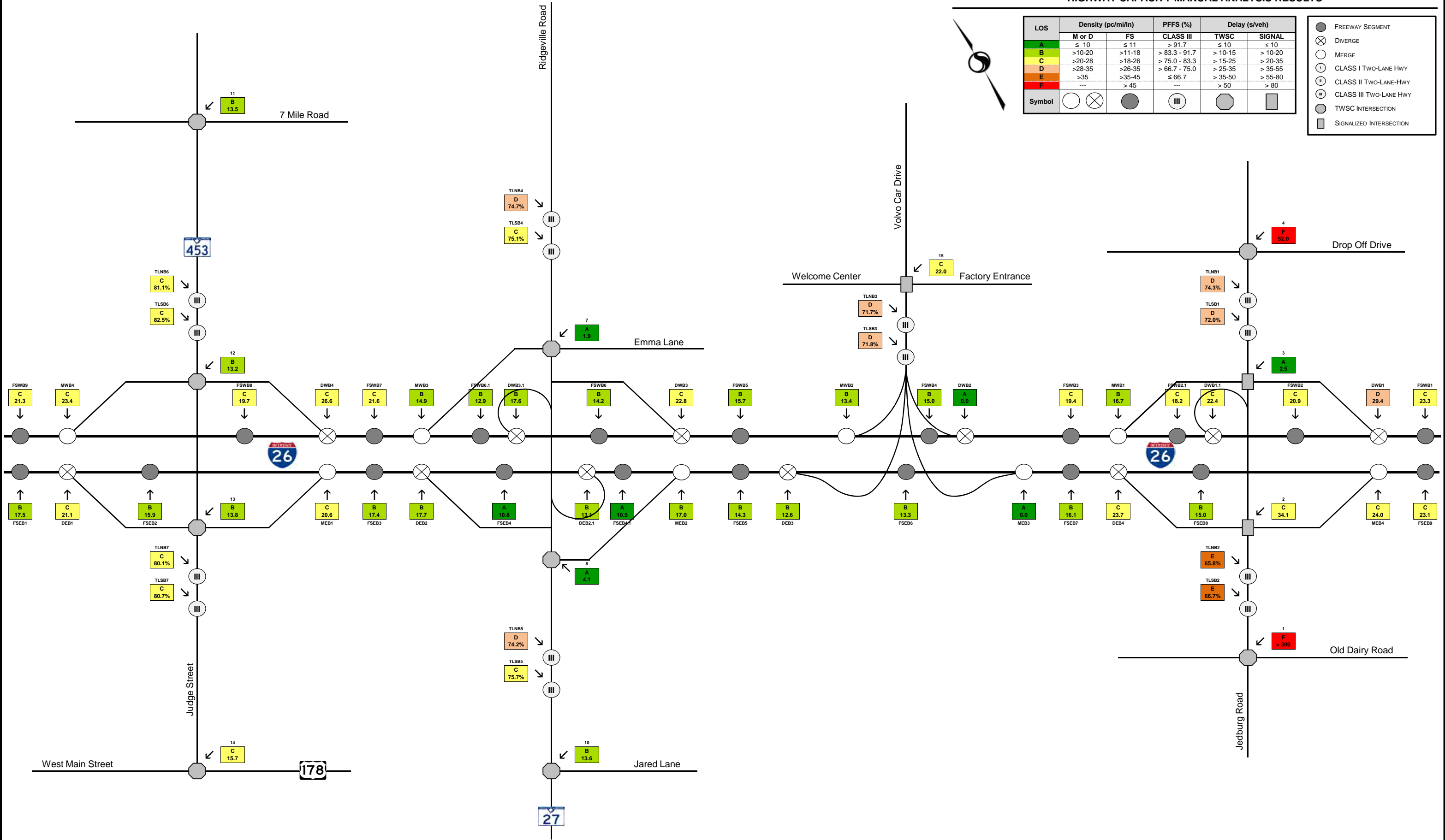
CLASS I TWO-LANE HWY

CLASS II TWO-LANE-HWY

CLASS III TWO-LANE HWY

TWSC INTERSECTION

SIGNALIZED INTERSECTION



2043 BUILD ALT 2 (PARCLO - B) PM PEAK HOUR
HIGHWAY CAPACITY MANUAL ANALYSIS RESULTS

LOS	Density (pc/mi/ln)		PFFS (%)	Delay (s/veh)	
	M or D	FS	CLASS III	TWSC	SIGNAL
A	≤ 10	≤ 11	> 91.7	≤ 10-15	≤ 10-20
B	>10-20	>11-18	> 83.3 - 91.7	> 10-15	> 20-35
C	>20-28	>18-26	> 75.0 - 83.3	> 15-25	> 35-55
D	>28-35	>26-35	> 66.7 - 75.0	> 25-35	> 55-80
E	>35	>35-45	≤ 66.7	> 35-50	> 80
F	---	> 45	---	> 50	> 80
Symbol					

FREEWAY SEGMENT

DIVERGE

MERGE

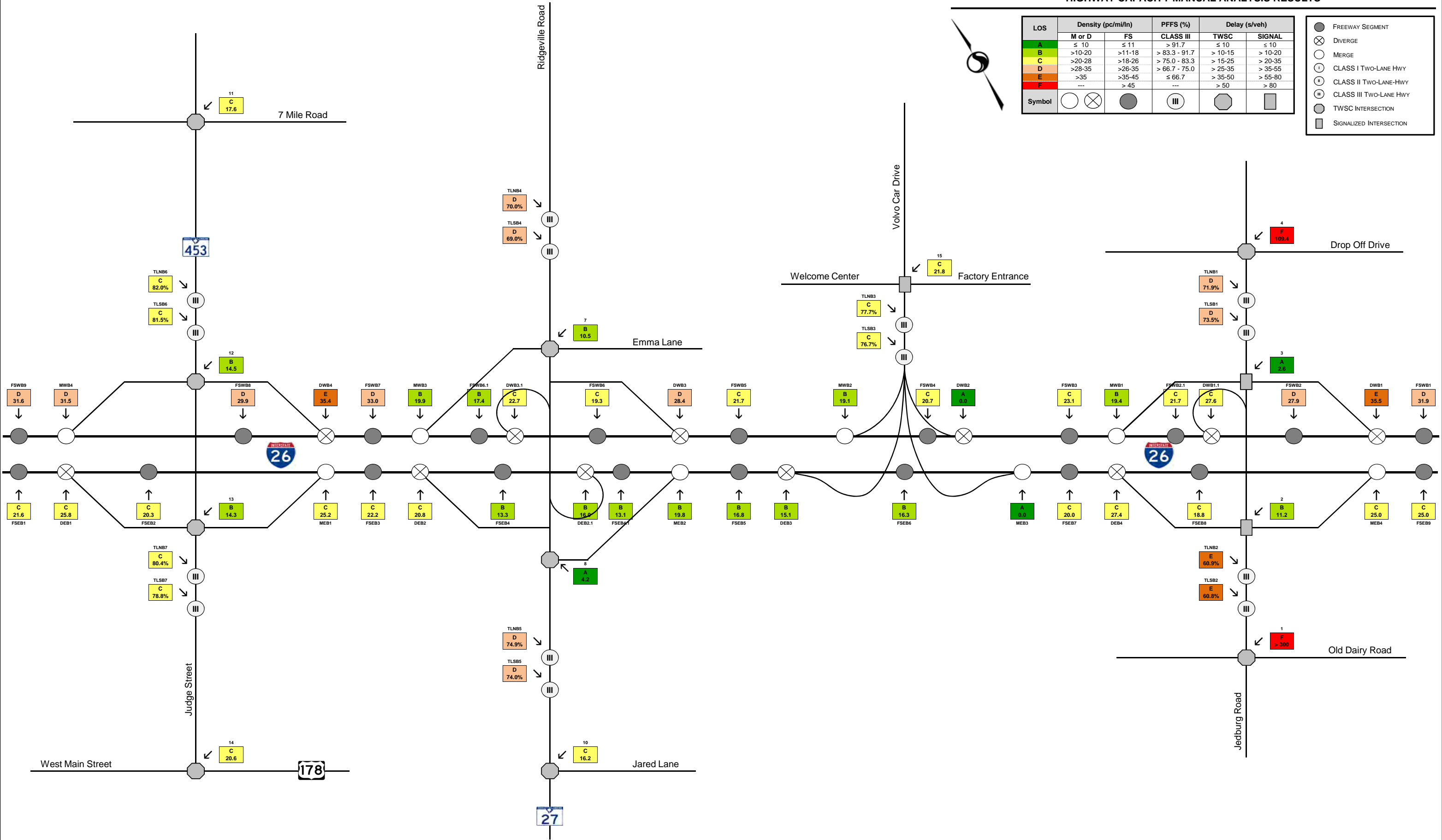
CLASS I TWO-LANE HWY

CLASS II TWO-LANE HWY

CLASS III TWO-LANE HWY

TWSC INTERSECTION

SIGNALIZED INTERSECTION



June 2019

B.8 2023 BUILD – ALTERNATIVE 3



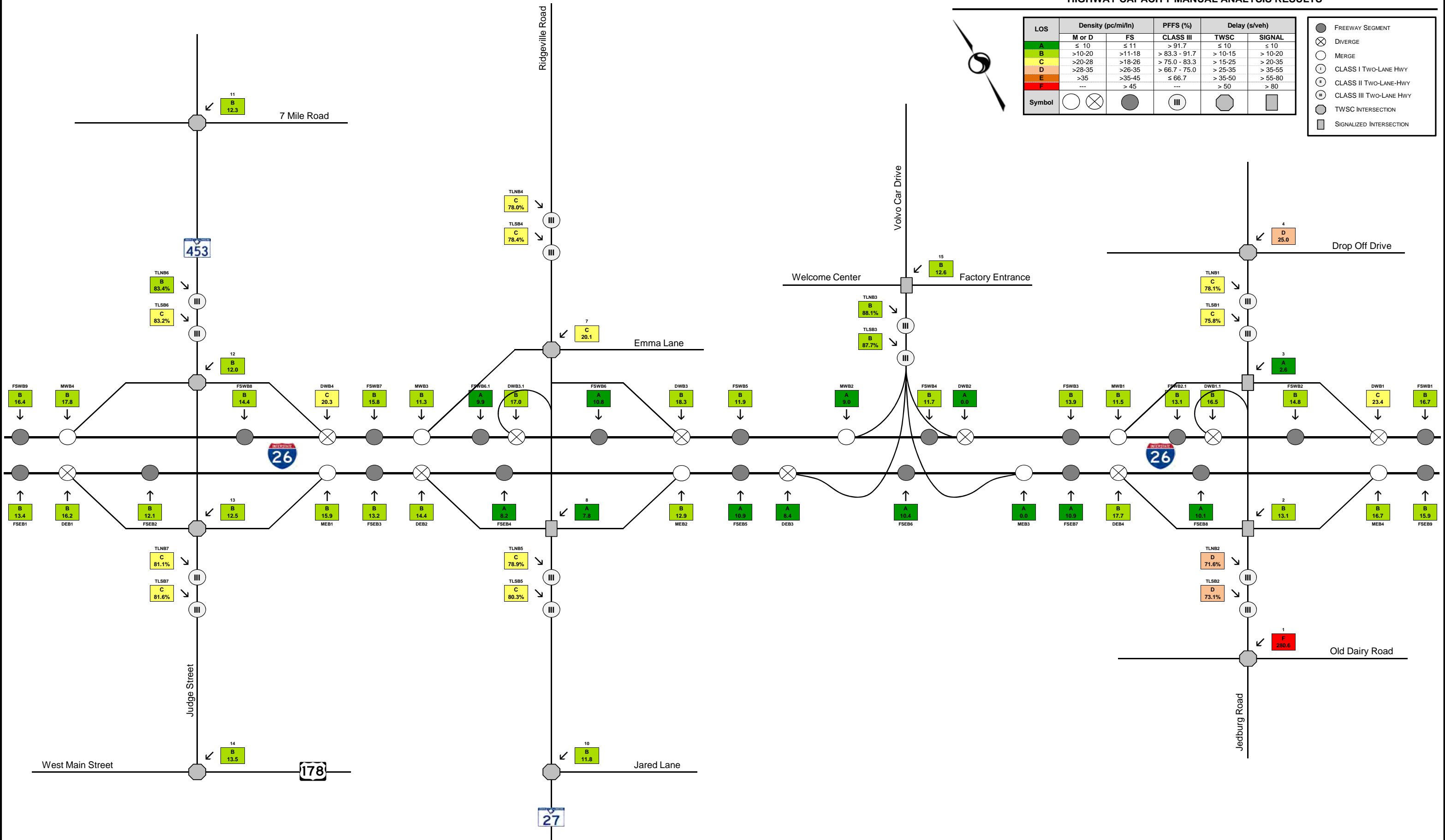
LOS	Density (pc/mi/ln)		PFFS (%)	Delay (s/veh)		I-26 Widening (MM 187 - MM 194) 2023 Build Alt 3 (Single-Loop) AM Peak Hour - HCM Analysis Results Performance Measures <div><div><div><div><div><div></div><div>Stantec</div></div></div><div><div></div><div></div></div></div><div>December, 2018</div></div></div>																Notes:					
	M or D	FS	CLASS III HWY	TWSC	SIGNAL																	FS	=	Freeway Segment	M	=	Merge Area
A	≤ 10	≤ 11	> 91.7	≤ 10	≤ 10																						
B	>10-20	>11-18	> 83.3 - 91.7	> 10-15	> 10-20																						
C	>20-28	>18-26	> 75.0 - 83.3	> 15-25	> 20-35																						
D	>28-35	>26-35	> 66.7 - 75.0	> 25-35	> 35-55																						
E	>35	>35-45	≤ 66.7	> 35-50	> 55-80																						
F	---	> 45	---	> 50	> 80																						
I-26 Section		Ramp Information										Mainline Information										HCM Results					
		Volume (veh/hr)	% HV	PHF	Length A/D lane (ft)	FFS**** (MPH)	Adj. Ramp Up/Down	Adj. Ramp Volume (veh/hr)	Adj. Ramp Distance (ft)	Adj. Ramp HV%	Adj. Ramp PHF	Volume (veh/hr)	% HV	PHF	No. of Lanes	Terrain	Driver Pop Factor	LW (ft)	LC (ft)	TRD (ramp/mi)	FFS (mph)	Flow Rate (pc/h/ln)	Average Speed (mph)	Density (pc/mi/ln)	Type	LOS	
FSEB1		---	---	---	---	---	---	---	---	---	1,525	24%	0.91	2	Level	1.00	12	6	1.00	72.2	938	70.0	13.4	FS	B		
DEB1		55	53%	0.95	465	35	Down/On	142	1,850	36%	0.90	1,525	24%	0.91	2	---	---	---	---	---	---	---	57.8	16.2	D	B	
FSEB2		---	---	---	---	---	---	---	---	---	1,470	24%	0.91	2	Level	1.00	12	6	0.33	74.1	905	75.0	12.1	FS	B		
MEB1		142	36%	0.90	800	35	Up/Off	55	1,850	53%	0.95	1,470	24%	0.91	2	---	---	---	---	---	---	---	65.0	15.9	M	B	
FSEB3		---	---	---	---	---	---	---	---	---	1,612	24%	0.91	2	Level	1.00	12	6	0.00	75.4	992	75.0	13.2	FS	B		
DEB2		119	23%	0.90	250	35	Down/On	507	4,000	16%	0.90	1,612	24%	0.91	3	---	---	---	---	---	---	---	57.6	14.4	D	B	
FSEB4		---	---	---	---	---	---	---	---	---	1,493	24%	0.91	3	Level	1.00	12	6	0.67	73.1	613	75.0	8.2	FS	A		
MEB2		507	16%	0.90	900	35	Up/Off	119	4,000	23%	0.90	1,493	24%	0.91	3	---	---	---	---	---	---	---	62.0	12.9	M	B	
FSEB5		---	---	---	---	---	---	---	---	---	2,000	24%	0.91	3	Level	1.00	12	6	0.67	73.1	821	75.0	10.9	FS	A		
DEB3		98	10%	0.92	1,200	35	Down/On	89	3,500	10%	0.92	2,000	24%	0.91	3	---	---	---	---	---	---	---	57.7	8.4	D	A	
FSEB6		---	---	---	---	---	---	---	---	---	1,902	24%	0.91	3	Level	1.00	12	6	0.67	73.1	780	75.0	10.4	FS	A		
MEB3		89	10%	0.92	2,000	35	Up/Off	98	3,500	10%	0.92	1,902	24%	0.91	3	---	---	---	---	---	---	---	69.0	0.0	M	A	
FSEB7		---	---	---	---	---	---	---	---	---	1,991	24%	0.91	3	Level	1.00	12	6	0.67	73.1	817	75.0	10.9	FS	A		
DEB4		145	29%	0.90	180	35	Down/On	864	2,900	11%	0.90	1,991	24%	0.91	3	---	---	---	---	---	---	---	57.6	17.7	D	B	
FSEB8		---	---	---	---	---	---	---	---	---	1,846	24%	0.91	3	Level	1.00	12	6	0.50	73.6	757	75.0	10.1	FS	A		
MEB4		864	11%	0.90	1,120	35	Up/Off	145	2,900	29%	0.90	1,846	24%	0.91	3	---	---	---	---	---	---	---	62.0	16.7	M	B	
FSEB9		---	---	---	---	---	---	---	---	---	2,710	24%	0.91	3	Level	1.00	12	6	1.20	71.6	1,112	70.0	15.9	FS	B		
FSWB1		---	---	---	---	---	---	---	---	---	2,902	22%	0.92	3	Level	1.00	12	6	1.33	71.3	1,167	70.0	16.7	FS	B		
DWB1		152	10%	0.90	150	35	Down/Off	316	920	10%	0.90	2,902	22%	0.92	3	---	---	---	---	---	---	---	57.6	23.4	D	C	
FSWB2		---	---	---	---	---	---	---	---	---	2,750	22%	0.92	3	Level	1.00	12	6	0.67	73.1	1,106	75.0	14.8	FS	B		
DWB1.1		316	10%	0.90	850	35	Down/On	151	750	11%	0.90	2,750	22%	0.92	3	---	---	---	---	---	---	---	57.1	16.5	D	B	
FSWB2.1		---	---	---	---	---	---	---	---	---	2,434	22%	0.92	3	Level	1.00	12	6	0.67	73.1	979	75.0	13.1	FS	B		
MWB1		151	11%	0.90	1,650	35	Up/Off	316	750	10%	0.90	2,434	22%	0.92	3	---	---	---	---	---	---	---	63.0	11.5	M	B	
FSWB3		---	---	---	---	---	---	---	---	---	2,585	22%	0.92	3	Level	1.00	12	6	0.83	72.6	1,040	75.0	13.9	FS	B		
DWB2		394	10%	0.92	3,000	35	Down/On	23	2,400	10%	0.92	2,585	22%	0.92	3	---	---	---	---	---	---	---	56.9	0.0	D	A	
FSWB4		---	---	---	---	---	---	---	---	---	2,191	22%	0.92	3	Level	1.00	12	6	0.83	72.6	881	75.0	11.7	FS	B		
MWB2		23	10%	0.92	1,800	35	Up/Off	394	2,400	10%	0.92	2,191	22%	0.92	3	---	---	---	---	---	---	---	63.0	9.0	M	A	
FSWB5		---	---	---	---	---	---	---	---	---	2,214	22%	0.92	3	Level	1.00	12	6	0.83	72.6	890	75.0	11.9	FS	B		
DWB3		202	25%	0.94	250	35	Down/Off	174	1,775	25%	0.94	2,214	22%	0.92	3	---	---	---	---	---	---	---	57.4	18.3	D	B	
FSWB6		---	---	---	---	---	---	---	---	---	2,012	22%	0.92	3	Level	1.00	12	6	0.83	72.6	809	75.0	10.8	FS	A		
DWB3.1		174	25%	0.94	650	35	Down/On	117	1,300	16%	0.90	2,012	22%	0.92	3	---	---	---	---	---	---	---	57.5	17.0	D	B	
FSWB6.1		---	---	---	---	---	---	---	---	---	1,838	22%	0.92	3	Level	1.00	12	6	0.83	72.6	739	75.0	9.9	FS	A		
MWB3		117	16%	0.90	900	35	Up/Off	174	1,300	25%	0.94	1,838	22%	0.92	3	---	---	---	---	---	---	---	62.0	11.3	M	B	
FSWB7		---	---	---	---	---	---	---	---	---	1,955	22%	0.92	2	Level	1.00	12	6	0.00	75.4	1,179	74.6	15.8	FS	B		
DWB4		161	46%	0.90	475	35	Down/On	54	1,850	36%	0.92	1,955	22%	0.92	2	---	---	---	---	---	---	---	57.5	20.3	D	C	
FSWB8		---	---	---	---	---	---	---	---	---	1,794	22%	0.92	2	Level	1.00	12	6	0.33	74.1	1,082	74.9	14.4	FS	B		
MWB4		54	36%	0.92	800	35	Up/Off	161	1,850	46%	0.90	1,794	22%	0.92	2	---	---	---	---	---	---	---	62.0	17.8	M	B	
FSWB9		---	---	---	---	---	---	---	---	---	1,898	22%	0.92	2	Level	1.00	12	6	1.00	72.2	1,145	70.0	16.4	FS	B		
Two-Lane Side-Street Section		Segment Information												Intentionally Left Blank						HCM Results							
		Terrain	SW (ft)	LW (ft)	Seg. Length (mi)**	PHF	Truck/ Bus %	Rec. Veh %***	% NPZ	Access Point Density	Analysis Direction Volume	Opposing Direction Volume	BFFS (mph)							FFS (mph)	V/C Ratio	PTSF	Average Speed (mph)	PFFS	Hwy Class	LOS	
TLNB1		Level	2.5	11.5	1.0	0.93	11%	0%	100%	14	352	562	50	43.5	Intentionally Left Blank						0.23	58.0%	34.0	78.1%	III	C	
TLSB1		Level	2.5	11.5	1.0	0.93	11%	0%	100%	14	562	352	50	43.5							0.36	76.9%	33.0	75.8%	III	C	
TLNB2		Level	2.5	11.5	1.0	0.94	11%	0%	60%	14	777	535	50	43.5							0.49	82.9%	31.2	71.6%	III	D	
TLSB2		Level	2.5	11.5	1.0	0.94	11%	0%	60%	14	535	777	50	43.5							0.34	69.8%	31.8	73.1%	III	D	
TLNB3		Level	6.0	12.0	1.0	0.92	10%	0%	20%	8	492	112	50	48.0							0.32	64.5%	42.3	88.1%	III	B	
TLSB3		Level	6.0	12.0	1.0	0.92	10%	0%	20%	8	112	492	50	48.0							0.08	22.7%	42.1	87.7%	III	B	
TLNB4		Level	1.0	12.0	1.0	0.93	16%	0%	100%	30	415	379	55	43.3							0.27	68.3%	33.8	78.0%	III	C	
TLSB4		Level	1.0	12.0	1.0	0.93	16%	0%	100%	30	379	415	55	43.3	0.25	66.0%	34.0	78.4%	III	C							

LOS	Density (pc/mi/ln)		PFFS (%)	Delay (s/veh)		<div>I-26 Widening (MM 187 - MM 194)</div> <div>2023 Build Alt 3 (Single-Loop) PM Peak Hour - HCM Analysis Results</div> <div><div><div><div></div><div>Stantec</div></div><div>December, 2018</div></div></div>																Notes:				
	M or D	FS	CLASS III HWY	TWSC	SIGNAL																	FS	=	Freeway Segment	M	=
A	≤ 10	≤ 11	> 91.7	≤ 10	≤ 10																					
B	>10-20	>11-18	> 83.3 - 91.7	> 10-15	> 10-20																					
C	>20-28	>18-26	> 75.0 - 83.3	> 15-25	> 20-35																					
D	>28-35	>26-35	> 66.7 - 75.0	> 25-35	> 35-55																					
E	>35	>35-45	≤ 66.7	> 35-50	> 55-80																					
F	---	> 45	---	> 50	> 80																					
I-26 Section		Ramp Information										Mainline Information										HCM Results				
		Volume (veh/hr)	% HV	PHF	Length A/D lane (ft)	FFS**** (MPH)	Adj. Ramp Up/Down	Adj. Ramp Volume (veh/hr)	Adj. Ramp Distance (ft)	Adj. Ramp HV%	Adj. Ramp PHF	Volume (veh/hr)	% HV	PHF	No. of Lanes	Terrain	Driver Pop Factor	LW (ft)	LC (ft)	TRD (ramp/mi)	FFS (mph)	Flow Rate (pc/h/ln)	Average Speed (mph)	Density (pc/mi/ln)	Type	LOS
FSEB1	---	---	---	---	---	---	---	---	---	---	2,010	10%	0.92	2	Level	1.00	12	6	1.00	72.2	1,147	70.0	16.4	FS	B	
DEB1	31	52%	0.90	465	35	Down/On	163	1,850	24%	0.90	2,010	10%	0.92	2	---	---	---	---	---	---	---	57.9	19.8	D	B	
FSEB2	---	---	---	---	---	---	---	---	---	---	1,979	10%	0.92	2	Level	1.00	12	6	0.33	74.1	1,129	74.8	15.1	FS	B	
MEB1	163	24%	0.90	800	35	Up/Off	31	1,850	52%	0.90	1,979	10%	0.92	2	---	---	---	---	---	---	---	61.0	19.6	M	B	
FSEB3	---	---	---	---	---	---	---	---	---	---	2,142	10%	0.92	2	Level	1.00	12	6	0.00	75.4	1,222	74.5	16.4	FS	B	
DEB2	135	8%	0.90	250	35	Down/On	519	4,000	7%	0.90	2,142	10%	0.92	3	---	---	---	---	---	---	---	57.6	17.0	D	B	
FSEB4	---	---	---	---	---	---	---	---	---	---	2,007	10%	0.92	3	Level	1.00	12	6	0.67	73.1	764	75.0	10.2	FS	A	
MEB2	519	7%	0.90	900	35	Up/Off	135	4,000	8%	0.90	2,007	10%	0.92	3	---	---	---	---	---	---	---	62.0	15.0	M	B	
FSEB5	---	---	---	---	---	---	---	---	---	---	2,526	10%	0.92	3	Level	1.00	12	6	0.67	73.1	961	75.0	12.8	FS	B	
DEB3	31	10%	0.92	1,200	35	Down/On	378	3,500	10%	0.92	2,526	10%	0.92	3	---	---	---	---	---	---	---	57.9	10.6	D	B	
FSEB6	---	---	---	---	---	---	---	---	---	---	2,495	10%	0.92	3	Level	1.00	12	6	0.67	73.1	949	75.0	12.7	FS	B	
MEB3	378	10%	0.92	2,000	35	Up/Off	31	3,500	10%	0.92	2,495	10%	0.92	3	---	---	---	---	---	---	---	69.0	0.0	M	A	
FSEB7	---	---	---	---	---	---	---	---	---	---	2,873	10%	0.92	3	Level	1.00	12	6	0.67	73.1	1,093	74.9	14.6	FS	B	
DEB4	158	19%	0.91	180	35	Down/On	644	2,900	7%	0.90	2,873	10%	0.92	3	---	---	---	---	---	---	---	57.5	22.0	D	C	
FSEB8	---	---	---	---	---	---	---	---	---	---	2,715	10%	0.92	3	Level	1.00	12	6	0.50	73.6	1,033	75.0	13.8	FS	B	
MEB4	644	7%	0.90	1,120	35	Up/Off	158	2,900	19%	0.91	2,715	10%	0.92	3	---	---	---	---	---	---	---	62.0	18.6	M	B	
FSEB9	---	---	---	---	---	---	---	---	---	---	3,359	10%	0.92	3	Level	1.00	12	6	1.20	71.6	1,278	69.9	18.3	FS	C	
FSWB1	---	---	---	---	---	---	---	---	---	---	3,767	15%	0.93	3	Level	1.00	12	6	1.33	71.3	1,451	69.3	20.9	FS	C	
DWB1	277	6%	0.95	150	35	Down/Off	627	920	6%	0.95	3,767	15%	0.93	3	---	---	---	---	---	---	---	57.3	27.7	D	C	
FSWB2	---	---	---	---	---	---	---	---	---	---	3,490	15%	0.93	3	Level	1.00	12	6	0.67	73.1	1,345	73.7	18.3	FS	C	
DWB1.1	627	6%	0.95	850	35	Down/On	155	750	7%	0.90	3,490	15%	0.93	3	---	---	---	---	---	---	---	56.3	20.6	D	C	
FSWB2.1	---	---	---	---	---	---	---	---	---	---	2,863	15%	0.93	3	Level	1.00	12	6	0.67	73.1	1,103	74.9	14.7	FS	B	
MWB1	155	7%	0.90	1,650	35	Up/Off	627	750	6%	0.95	2,863	15%	0.93	3	---	---	---	---	---	---	---	63.0	13.2	M	B	
FSWB3	---	---	---	---	---	---	---	---	---	---	3,018	15%	0.93	3	Level	1.00	12	6	0.83	72.6	1,163	74.7	15.6	FS	B	
DWB2	124	10%	0.92	3,000	35	Down/On	94	2,400	10%	0.92	3,018	15%	0.93	3	---	---	---	---	---	---	---	57.7	0.0	D	A	
FSWB4	---	---	---	---	---	---	---	---	---	---	2,894	15%	0.93	3	Level	1.00	12	6	0.83	72.6	1,115	74.9	14.9	FS	B	
MWB2	94	10%	0.92	1,800	35	Up/Off	124	2,400	10%	0.92	2,894	15%	0.93	3	---	---	---	---	---	---	---	63.0	13.0	M	B	
FSWB5	---	---	---	---	---	---	---	---	---	---	2,988	15%	0.93	3	Level	1.00	12	6	0.83	72.6	1,151	74.7	15.4	FS	B	
DWB3	287	7%	0.91	250	35	Down/Off	221	1,775	7%	0.91	2,988	15%	0.93	3	---	---	---	---	---	---	---	57.2	22.5	D	C	
FSWB6	---	---	---	---	---	---	---	---	---	---	2,701	15%	0.93	3	Level	1.00	12	6	0.83	72.6	1,041	75.0	13.9	FS	B	
DWB3.1	221	7%	0.91	650	35	Down/On	155	1,300	7%	0.90	2,701	15%	0.93	3	---	---	---	---	---	---	---	57.4	17.1	D	B	
FSWB6.1	---	---	---	---	---	---	---	---	---	---	2,480	15%	0.93	3	Level	1.00	12	6	0.83	72.6	956	75.0	12.7	FS	B	
MWB3	155	7%	0.90	900	35	Up/Off	221	1,300	7%	0.91	2,480	15%	0.93	3	---	---	---	---	---	---	---	62.0	14.6	M	B	
FSWB7	---	---	---	---	---	---	---	---	---	---	2,635	15%	0.93	2	Level	1.00	12	6	0.00	75.4	1,523	72.0	21.2	FS	C	
DWB4	166	21%	0.90	475	35	Down/On	57	1,850	24%	0.90	2,635	15%	0.93	2	---	---	---	---	---	---	---	57.5	26.2	D	C	
FSWB8	---	---	---	---	---	---	---	---	---	---	2,469	15%	0.93	2	Level	1.00	12	6	0.33	74.1	1,427	73.0	19.6	FS	C	
MWB4	57	24%	0.90	800	35	Up/Off	166	1,850	21%	0.90	2,469	15%	0.93	2	---	---	---	---	---	---	---	61.0	23.2	M	C	
FSWB9	---	---	---	---	---	---	---	---	---	---	2,526	15%	0.93	2	Level	1.00	12	6	1.00	72.2	1,460	69.2	21.1	FS	C	
Two-Lane Side-Street Section	Segment Information													Intentionally Left Blank						HCM Results						
	Terrain	SW (ft)	LW (ft)	Seg. Length (mi)**	PHF	Truck/ Bus %	Rec. Veh %***	% NPZ	Access Point Density	Analysis Direction Volume	Opposing Direction Volume	BFFS (mph)	FFS (mph)							V/C Ratio	PTSF	Average Speed (mph)	PFFS	Hwy Class	LOS	
TLNB1	Level	2.5	11.5	1.0	0.95	7%	0%	100%	14	561	407	50	43.5							0.35	77.9%	33.0	75.8%	III	C	
TLSB1	Level	2.5	11.5	1.0	0.95	7%	0%	100%	14	407	561	50	43.5							0.26	63.3%	33.7	77.4%	III	C	
TLNB2	Level	2.5	11.5	1.0	0.92	7%	0%	60%	14	686	836	50	43.5							0.44	78.1%	29.9	68.8%	III	D	
TLSB2	Level	2.5	11.5	1.0	0.92	7%	0%	60%	14	836	686	50	43.5							0.53	85.0.					

2023 BUILD ALT 3 (SINGLE-LOOP) AM PEAK HOUR
HIGHWAY CAPACITY MANUAL ANALYSIS RESULTS

LOS	Density (pc/mi/ln)		PFFS (%)	Delay (s/veh)	
	M or D	FS	CLASS III	TWSC	SIGNAL
A	≤ 10	≤ 11	> 91.7	≤ 10	≤ 10
B	>10-20	>11-18	> 83.3 - 91.7	> 10-15	> 10-20
C	>20-28	>18-26	> 75.0 - 83.3	> 15-25	> 20-35
D	>28-35	>26-35	> 66.7 - 75.0	> 25-35	> 35-55
E	>35	>35-45	≤ 66.7	> 35-50	> 55-80
F	---	> 45	---	> 50	> 80
Symbol					

- FREEWAY SEGMENT
- DIVERGE
- MERGE
- CLASS I TWO-LANE HWY
- CLASS II TWO-LANE-HWY
- CLASS III TWO-LANE HWY
- TWSC INTERSECTION
- SIGNALIZED INTERSECTION



2023 BUILD ALT 3 (SINGLE-LOOP) PM PEAK HOUR
HIGHWAY CAPACITY MANUAL ANALYSIS RESULTS

LOS	Density (pc/mi/ln)		PFFS (%)	Delay (s/veh)	
	M or D	FS	CLASS III	TWSC	SIGNAL
A	≤ 10	≤ 11	> 91.7	≤ 10-15	≤ 10-20
B	>10-20	>11-18	> 83.3 - 91.7	> 10-15	> 20-35
C	>20-28	>18-26	> 75.0 - 83.3	> 15-25	> 35-55
D	>28-35	>26-35	> 66.7 - 75.0	> 25-35	> 55-80
E	>35	>35-45	≤ 66.7	> 35-50	> 80
F	---	> 45	---	> 50	> 80
Symbol					

FREEWAY SEGMENT

DIVERGE

MERGE

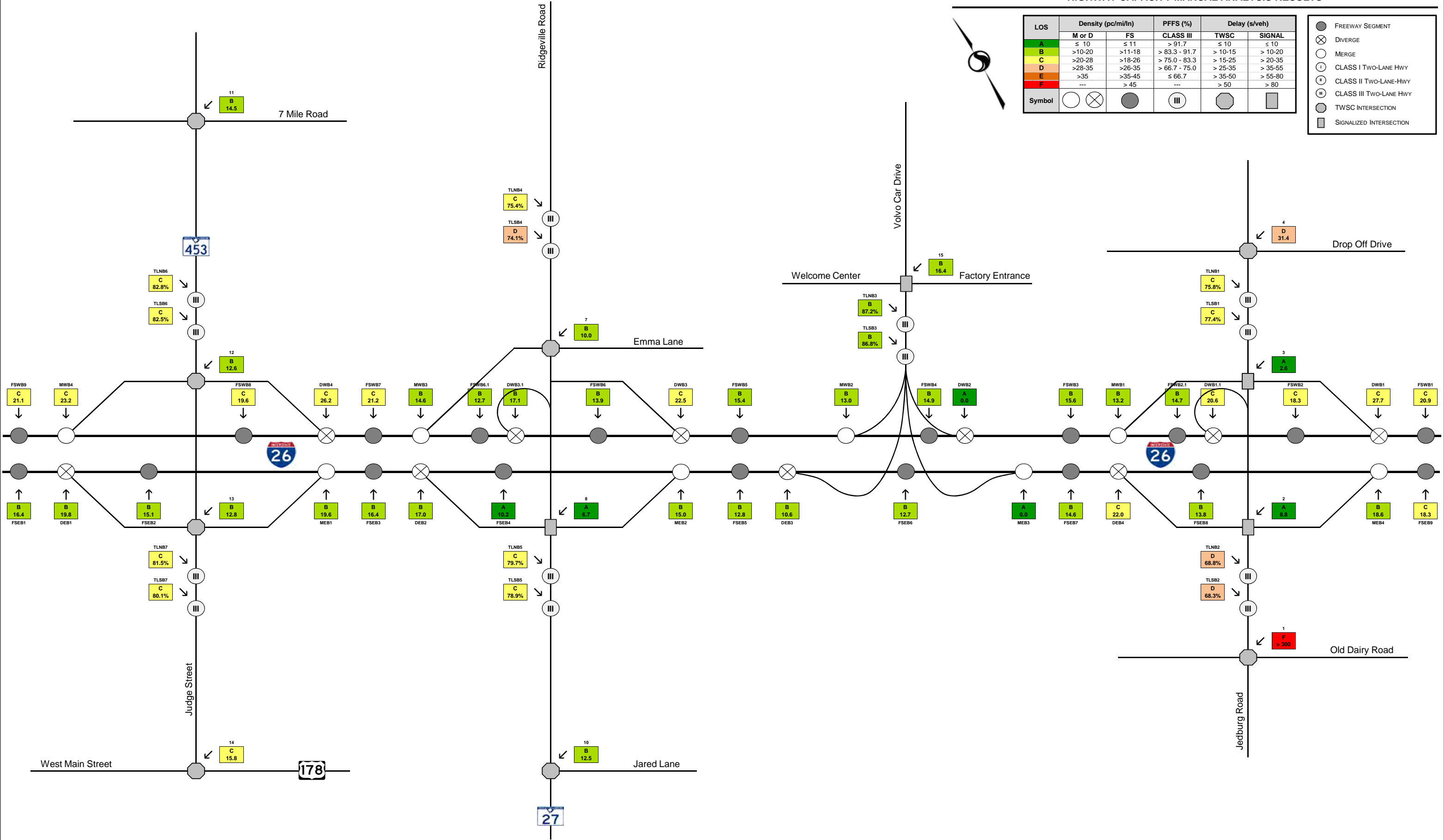
CLASS I TWO-LANE HWY

CLASS II TWO-LANE HWY

CLASS III TWO-LANE HWY

TWSC INTERSECTION

SIGNALIZED INTERSECTION



June 2019

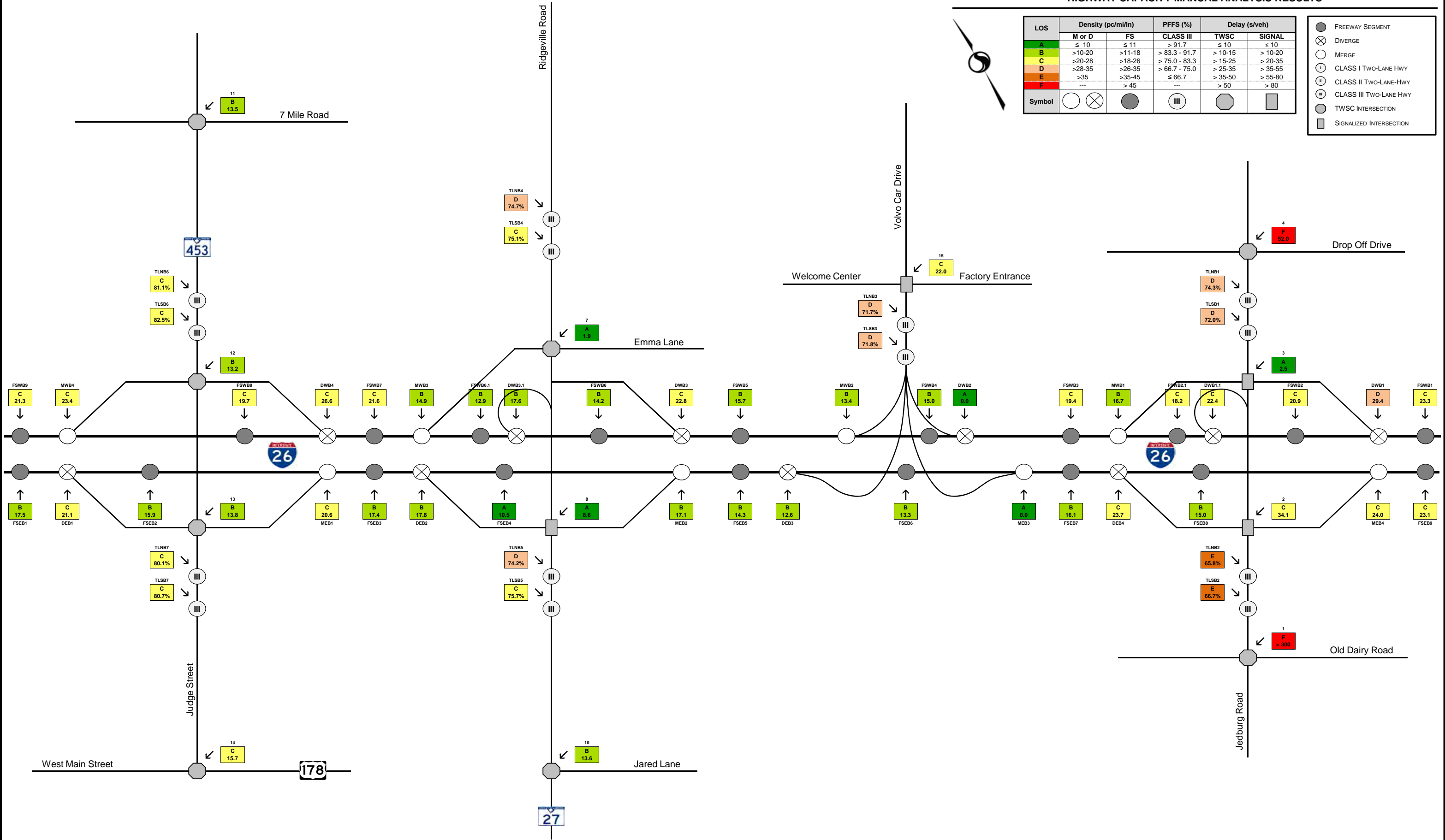
B.9 2043 BUILD – ALTERNATIVE 3



2043 BUILD ALT 3 (SINGLE-LOOP) AM PEAK HOUR
HIGHWAY CAPACITY MANUAL ANALYSIS RESULTS

LOS	Density (pc/mi/ln)		PFFS (%)	Delay (s/veh)	
	M or D	FS	CLASS III	TWSC	SIGNAL
A	≤ 10	≤ 11	> 91.7	≤ 10-15	≤ 10-20
B	>10-20	>11-18	> 83.3 - 91.7	> 10-15	> 20-35
C	>20-28	>18-26	> 75.0 - 83.3	> 25-35	> 35-55
D	>28-35	>26-35	> 66.7 - 75.0	> 35-50	> 55-80
E	>35	>35-45	≤ 66.7	> 50	> 80
F	---	> 45	---	> 50	> 80
Symbol					

- FREEWAY SEGMENT
- DIVERGE
- MERGE
- CLASS I TWO-LANE HWY
- CLASS II TWO-LANE-HWY
- CLASS III TWO-LANE HWY
- TWSC INTERSECTION
- SIGNALIZED INTERSECTION



2043 BUILD ALT 3 (SINGLE-LOOP) PM PEAK HOUR
HIGHWAY CAPACITY MANUAL ANALYSIS RESULTS

LOS	Density (pc/mi/ln)		PFFS (%)	Delay (s/veh)	
	M or D	FS	CLASS III	TWSC	SIGNAL
A	≤ 10	≤ 11	> 91.7	≤ 10-15	≤ 10-20
B	>10-20	>11-18	> 83.3 - 91.7	> 10-15	> 20-35
C	>20-28	>18-26	> 75.0 - 83.3	> 25-35	> 35-55
D	>28-35	>26-35	> 66.7 - 75.0	> 35-50	> 55-80
E	>35	>35-45	≤ 66.7	> 50	> 80
F	---	> 45	---	> 50	> 80
Symbol					

FREEWAY SEGMENT

DIVERGE

MERGE

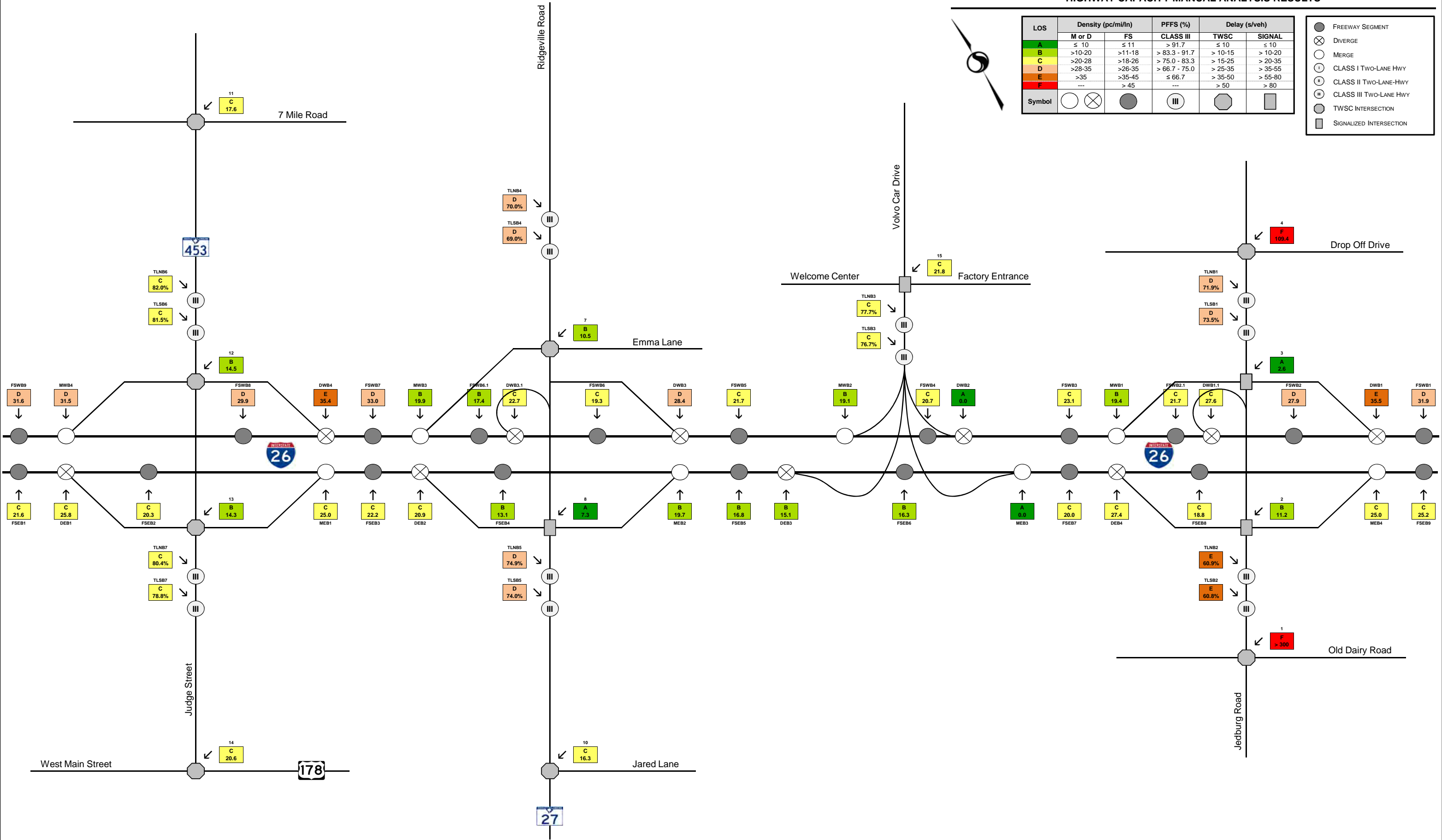
CLASS I TWO-LANE HWY

CLASS II TWO-LANE HWY

CLASS III TWO-LANE HWY

TWSC INTERSECTION

SIGNALIZED INTERSECTION



I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

June 2019

B.10 2023 BUILD – ALTERNATIVE 4



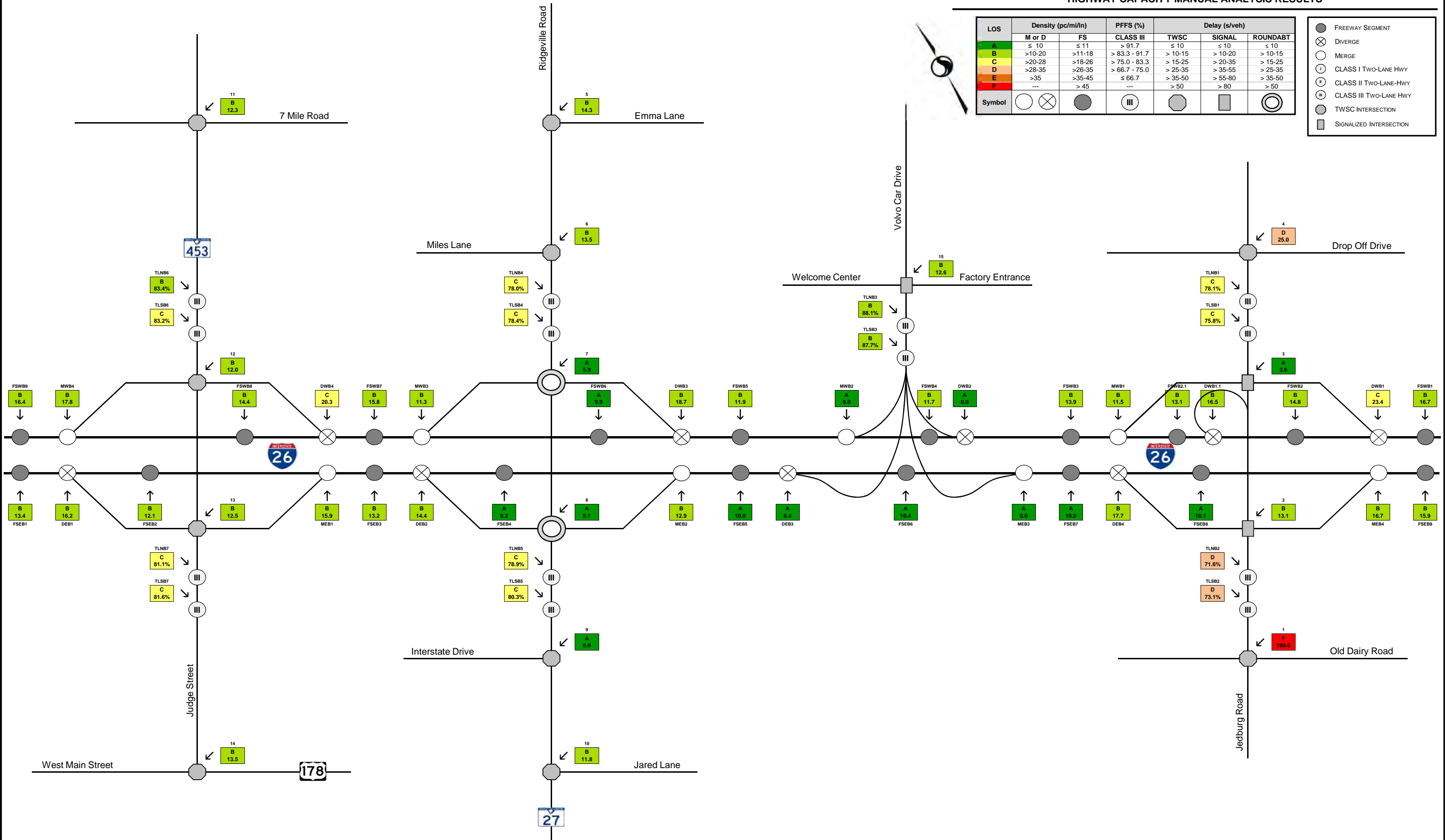
LOS	Density (pc/mi/ln)		PFFS (%)	Delay (s/veh)		I-26 Widening (MM 187 - MM 194)																Notes:																	
	M or D	FS	CLASS III HWY	TWSC	SIGNAL	2023 Build Alt 4 (Diamond_Rbt) AM Peak Hour - HCM Analysis Results																FS	=	Freeway Segment	M	=	Merge Area	D	=	Diverge Area	TL	=	Two-Lane Segment	TWSC	=	Two-Way Stop Control	SIGNAL	=	Signalized Intersection
A	≤ 10	≤ 11	> 91.7	≤ 10	≤ 10																																		
B	>10-20	>11-18	> 83.3 - 91.7	> 10-15	> 10-20																																		
C	>20-28	>18-26	> 75.0 - 83.3	> 15-25	> 20-35																																		
D	>28-35	>26-35	> 66.7 - 75.0	> 25-35	> 35-55																																		
E	>35	>35-45	≤ 66.7	> 35-50	> 55-80																																		
F	---	> 45	---	> 50	> 80																																		
I-26 Section	Ramp Information										Mainline Information										HCM Results																		
	Volume (veh/hr)	% HV	PHF	Length A/D lane (ft)	FFS**** (MPH)	Adj. Ramp Up/Down	Adj. Ramp Volume (veh/hr)	Adj. Ramp Distance (ft)	Adj. Ramp HV%	Adj. Ramp PHF	Volume (veh/hr)	% HV	PHF	No. of Lanes	Terrain	Driver Pop Factor	LW (ft)	LC (ft)	TRD (ramp/mi)	FFS (mph)	Flow Rate (pc/h/ln)	Average Speed (mph)	Density (pc/mi/ln)	Type	LOS														
FSEB1	---	---	---	---	---	---	---	---	---	---	1,525	24%	0.91	2	Level	1.00	12	6	1.00	72.2	938	70.0	13.4	FS	B														
DEB1	55	53%	0.95	465	35	Down/On	142	1,850	36%	0.90	1,525	24%	0.91	2	---	---	---	---	---	---	---	57.8	16.2	D	B														
FSEB2	---	---	---	---	---	---	---	---	---	---	1,470	24%	0.91	2	Level	1.00	12	6	0.33	74.1	905	75.0	12.1	FS	B														
MEB1	142	36%	0.90	800	35	Up/Off	55	1,850	53%	0.95	1,470	24%	0.91	2	---	---	---	---	---	---	---	65.0	15.9	M	B														
FSEB3	---	---	---	---	---	---	---	---	---	---	1,612	24%	0.91	2	Level	1.00	12	6	0.00	75.4	992	75.0	13.2	FS	B														
DEB2	119	23%	0.90	250	35	Down/On	507	2,300	16%	0.90	1,612	24%	0.91	3	---	---	---	---	---	---	---	57.6	14.4	D	B														
FSEB4	---	---	---	---	---	---	---	---	---	---	1,493	24%	0.91	3	Level	1.00	12	6	0.67	73.1	613	75.0	8.2	FS	A														
MEB2	507	16%	0.90	900	35	Up/Off	119	2,300	23%	0.90	1,493	24%	0.91	3	---	---	---	---	---	---	---	62.0	12.9	M	B														
FSEB5	---	---	---	---	---	---	---	---	---	---	2,000	24%	0.91	3	Level	1.00	12	6	0.67	73.1	821	75.0	10.9	FS	A														
DEB3	98	10%	0.92	1,200	35	Down/On	89	3,500	10%	0.92	2,000	24%	0.91	3	---	---	---	---	---	---	---	57.7	8.4	D	A														
FSEB6	---	---	---	---	---	---	---	---	---	---	1,902	24%	0.91	3	Level	1.00	12	6	0.67	73.1	780	75.0	10.4	FS	A														
MEB3	89	10%	0.92	2,000	35	Up/Off	98	3,500	10%	0.92	1,902	24%	0.91	3	---	---	---	---	---	---	---	69.0	0.0	M	A														
FSEB7	---	---	---	---	---	---	---	---	---	---	1,991	24%	0.91	3	Level	1.00	12	6	0.67	73.1	817	75.0	10.9	FS	A														
DEB4	145	29%	0.90	180	35	Down/On	864	2,900	11%	0.90	1,991	24%	0.91	3	---	---	---	---	---	---	---	57.6	17.7	D	B														
FSEB8	---	---	---	---	---	---	---	---	---	---	1,846	24%	0.91	3	Level	1.00	12	6	0.50	73.6	757	75.0	10.1	FS	A														
MEB4	864	11%	0.90	1,120	35	Up/Off	145	2,900	29%	0.90	1,846	24%	0.91	3	---	---	---	---	---	---	---	62.0	16.7	M	B														
FSEB9	---	---	---	---	---	---	---	---	---	---	2,710	24%	0.91	3	Level	1.00	12	6	1.20	71.6	1,112	70.0	15.9	FS	B														
FSWB1	---	---	---	---	---	---	---	---	---	---	2,902	22%	0.92	3	Level	1.00	12	6	1.33	71.3	1,167	70.0	16.7	FS	B														
DWB1	152	10%	0.90	150	35	Down/Off	316	920	10%	0.90	2,902	22%	0.92	3	---	---	---	---	---	---	---	57.6	23.4	D	C														
FSWB2	---	---	---	---	---	---	---	---	---	---	2,750	22%	0.92	3	Level	1.00	12	6	0.67	73.1	1,106	75.0	14.8	FS	B														
DWB1.1	316	10%	0.90	850	35	Down/On	151	750	11%	0.90	2,750	22%	0.92	3	---	---	---	---	---	---	---	57.1	16.5	D	B														
FSWB2.1	---	---	---	---	---	---	---	---	---	---	2,434	22%	0.92	3	Level	1.00	12	6	0.67	73.1	979	75.0	13.1	FS	B														
MWB1	151	11%	0.90	1,650	35	Up/Off	316	750	10%	0.90	2,434	22%	0.92	3	---	---	---	---	---	---	---	63.0	11.5	M	B														
FSWB3	---	---	---	---	---	---	---	---	---	---	2,585	22%	0.92	3	Level	1.00	12	6	0.83	72.6	1,040	75.0	13.9	FS	B														
DWB2	394	10%	0.92	3,000	35	Down/On	23	2,400	10%	0.92	2,585	22%	0.92	3	---	---	---	---	---	---	---	56.9	0.0	D	A														
FSWB4	---	---	---	---	---	---	---	---	---	---	2,191	22%	0.92	3	Level	1.00	12	6	0.67	73.1	881	75.0	11.7	FS	B														
MWB2	23	10%	0.92	1,800	35	Up/Off	394	2,400	10%	0.92	2,191	22%	0.92	3	---	---	---	---	---	---	---	63.0	9.0	M	A														
FSWB5	---	---	---	---	---	---	---	---	---	---	2,214	22%	0.92	3	Level	1.00	12	6	0.67	73.1	890	75.0	11.9	FS	B														
DWB3	376	25%	0.94	250	35	Down/On	117	2,500	16%	0.90	2,214	22%	0.92	3	---	---	---	---	---	---	---	56.9	18.7	D	B														
FSWB6	---	---	---	---	---	---	---	---	---	---	1,838	22%	0.92	3	Level	1.00	12	6	0.67	73.1	739	75.0	9.9	FS	A														
MWB3	117	16%	0.90	900	35	Up/Off	376	2,500	25%	0.94	1,838	22%	0.92	3	---	---	---	---	---	---	---	62.0	11.3	M	B														
FSWB7	---	---	---	---	---	---	---	---	---	---	1,955	22%	0.92	2	Level	1.00	12	6	0.00	75.4	1,179	74.6	15.8	FS	B														
DWB4	161	46%	0.90	475	35	Down/On	54	1,850	36%	0.92	1,955	22%	0.92	2	---	---	---	---	---	---	---	57.5	20.3	D	C														
FSWB8	---	---	---	---	---	---	---	---	---	---	1,794	22%	0.92	2	Level	1.00	12	6	0.33	74.1	1,082	74.9	14.4	FS	B														
MWB4	54	36%	0.92	800	35	Up/Off	161	1,850	46%	0.90	1,794	22%	0.92	2	---	---	---	---	---	---	---	62.0	17.8	M	B														
FSWB9	---	---	---	---	---	---	---	---	---	---	1,898	22%	0.92	2	Level	1.00	12	6	1.00	72.2	1,145	70.0	16.4	FS	B														
Two-Lane Side-Street Section	Segment Information													Intentionally Left Blank						HCM Results																			
	Terrain	SW (ft)	LW (ft)	Seg. Length (mi)**	PHF	Truck/ Bus %	Rec. Veh %***	% NPZ	Access Point Density	Analysis Direction Volume	Opposing Direction Volume	BFFS (mph)	FFS (mph)							V/C Ratio	PTSF	Average Speed (mph)	PFFS	Hwy Class	LOS														
TLNB1	Level	2.5																																					

LOS	Density (pc/mi/ln)		PFFS (%)	Delay (s/veh)		I-26 Widening (MM 187 - MM 194) 2023 Build Alt 4 (Diamond_Rbt) PM Peak Hour - HCM Analysis Results Performance Measures <div><div><div><div></div><div>Stantec</div></div><div>December, 2018</div></div></div>																Notes:							
	M or D	FS	CLASS III HWY	TWSC	SIGNAL																	FS	=	Freeway Segment	M	=	Merge Area	D	=
A	≤ 10	≤ 11	> 91.7	≤ 10	≤ 10																								
B	>10-20	>11-18	> 83.3 - 91.7	> 10-15	> 10-20																								
C	>20-28	>18-26	> 75.0 - 83.3	> 15-25	> 20-35																								
D	>28-35	>26-35	> 66.7 - 75.0	> 25-35	> 35-55																								
E	>35	>35-45	≤ 66.7	> 35-50	> 55-80																								
F	---	> 45	---	> 50	> 80																								
I-26 Section	Ramp Information										Mainline Information										HCM Results								
	Volume (veh/hr)	% HV	PHF	Length A/D lane (ft)	FFS**** (MPH)	Adj. Ramp Up/Down	Adj. Ramp Volume (veh/hr)	Adj. Ramp Distance (ft)	Adj. Ramp HV%	Adj. Ramp PHF	Volume (veh/hr)	% HV	PHF	No. of Lanes	Terrain	Driver Pop Factor	LW (ft)	LC (ft)	TRD (ramp/mi)	FFS (mph)	Flow Rate (pc/h/ln)	Average Speed (mph)	Density (pc/mi/ln)	Type	LOS				
FSEB1	---	---	---	---	---	---	---	---	---	---	2,010	10%	0.92	2	Level	1.00	12	6	1.00	72.2	1,147	70.0	16.4	FS	B				
DEB1	31	52%	0.90	465	35	Down/On	163	1,850	24%	0.90	2,010	10%	0.92	2	---	---	---	---	---	---	---	57.9	19.8	D	B				
FSEB2	---	---	---	---	---	---	---	---	---	---	1,979	10%	0.92	2	Level	1.00	12	6	0.33	74.1	1,129	74.8	15.1	FS	B				
MEB1	163	24%	0.90	800	35	Up/Off	31	1,850	52%	0.90	1,979	10%	0.92	2	---	---	---	---	---	---	---	61.0	19.6	M	B				
FSEB3	---	---	---	---	---	---	---	---	---	---	2,142	10%	0.92	2	Level	1.00	12	6	0.00	75.4	1,222	74.5	16.4	FS	B				
DEB2	135	8%	0.90	250	35	Down/On	519	2,300	7%	0.90	2,142	10%	0.92	3	---	---	---	---	---	---	---	57.6	17.0	D	B				
FSEB4	---	---	---	---	---	---	---	---	---	---	2,007	10%	0.92	3	Level	1.00	12	6	0.67	73.1	764	75.0	10.2	FS	A				
MEB2	519	7%	0.90	900	35	Up/Off	135	2,300	8%	0.90	2,007	10%	0.92	3	---	---	---	---	---	---	---	62.0	15.0	M	B				
FSEB5	---	---	---	---	---	---	---	---	---	---	2,526	10%	0.92	3	Level	1.00	12	6	0.67	73.1	961	75.0	12.8	FS	B				
DEB3	31	10%	0.92	1,200	35	Down/On	378	3,500	10%	0.92	2,526	10%	0.92	3	---	---	---	---	---	---	---	57.9	10.6	D	B				
FSEB6	---	---	---	---	---	---	---	---	---	---	2,495	10%	0.92	3	Level	1.00	12	6	0.67	73.1	949	75.0	12.7	FS	B				
MEB3	378	10%	0.92	2,000	35	Up/Off	31	3,500	10%	0.92	2,495	10%	0.92	3	---	---	---	---	---	---	---	69.0	0.0	M	A				
FSEB7	---	---	---	---	---	---	---	---	---	---	2,873	10%	0.92	3	Level	1.00	12	6	0.67	73.1	1,093	74.9	14.6	FS	B				
DEB4	158	19%	0.91	180	35	Down/On	644	2,900	7%	0.90	2,873	10%	0.92	3	---	---	---	---	---	---	---	57.5	22.0	D	C				
FSEB8	---	---	---	---	---	---	---	---	---	---	2,715	10%	0.92	3	Level	1.00	12	6	0.50	73.6	1,033	75.0	13.8	FS	B				
MEB4	644	7%	0.90	1,120	35	Up/Off	158	2,900	19%	0.91	2,715	10%	0.92	3	---	---	---	---	---	---	---	62.0	18.6	M	B				
FSEB9	---	---	---	---	---	---	---	---	---	---	3,359	10%	0.92	3	Level	1.00	12	6	1.20	71.6	1,278	69.9	18.3	FS	C				
FSWB1	---	---	---	---	---	---	---	---	---	---	3,767	15%	0.93	3	Level	1.00	12	6	1.33	71.3	1,451	69.3	20.9	FS	C				
DWB1	277	6%	0.95	150	35	Down/Off	627	920	6%	0.95	3,767	15%	0.93	3	---	---	---	---	---	---	---	57.3	27.7	D	C				
FSWB2	---	---	---	---	---	---	---	---	---	---	3,490	15%	0.93	3	Level	1.00	12	6	0.67	73.1	1,345	73.7	18.3	FS	C				
DWB1.1	627	6%	0.95	850	35	Down/On	155	750	7%	0.90	3,490	15%	0.93	3	---	---	---	---	---	---	---	56.3	20.6	D	C				
FSWB2.1	---	---	---	---	---	---	---	---	---	---	2,863	15%	0.93	3	Level	1.00	12	6	0.67	73.1	1,103	74.9	14.7	FS	B				
MWB1	155	7%	0.90	1,650	35	Up/Off	627	750	6%	0.95	2,863	15%	0.93	3	---	---	---	---	---	---	---	63.0	13.2	M	B				
FSWB3	---	---	---	---	---	---	---	---	---	---	3,018	15%	0.93	3	Level	1.00	12	6	0.83	72.6	1,163	74.7	15.6	FS	B				
DWB2	124	10%	0.92	3,000	35	Down/On	94	2,400	10%	0.92	3,018	15%	0.93	3	---	---	---	---	---	---	---	57.7	0.0	D	A				
FSWB4	---	---	---	---	---	---	---	---	---	---	2,894	15%	0.93	3	Level	1.00	12	6	0.67	73.1	1,115	74.9	14.9	FS	B				
MWB2	94	10%	0.92	1,800	35	Up/Off	124	2,400	10%	0.92	2,894	15%	0.93	3	---	---	---	---	---	---	---	63.0	13.0	M	B				
FSWB5	---	---	---	---	---	---	---	---	---	---	2,988	15%	0.93	3	Level	1.00	12	6	0.67	73.1	1,151	74.7	15.4	FS	B				
DWB3	508	7%	0.91	250	35	Down/On	155	2,500	7%	0.90	2,988	15%	0.93	3	---	---	---	---	---	---	---	56.6	23.0	D	C				
FSWB6	---	---	---	---	---	---	---	---	---	---	2,480	15%	0.93	3	Level	1.00	12	6	0.67	73.1	956	75.0	12.7	FS	B				
MWB3	155	7%	0.90	900	35	Up/Off	508	2,500	7%	0.91	2,480	15%	0.93	3	---	---	---	---	---	---	---	62.0	14.6	M	B				
FSWB7	---	---	---	---	---	---	---	---	---	---	2,635	15%	0.93	2	Level	1.00	12	6	0.00	75.4	1,523	72.0	21.2	FS	C				
DWB4	166	21%	0.90	475	35	Down/On	57	1,850	24%	0.90	2,635	15%	0.93	2	---	---	---	---	---	---	---	57.5	26.2	D	C				
FSWB8	---	---	---	---	---	---	---	---	---	---	2,469	15%	0.93	2	Level	1.00	12	6	0.33	74.1	1,427	73.0	19.6	FS	C				
MWB4	57	24%	0.90	800	35	Up/Off	166	1,850	21%	0.90	2,469	15%	0.93	2	---	---	---	---	---	---	---	61.0	23.2	M	C				
FSWB9	---	---	---	---	---	---	---	---	---	---	2,526	15%	0.93	2	Level	1.00	12	6	1.00	72.2	1,460	69.2	21.1	FS	C				
Two-Lane Side-Street Section	Segment Information													Intentionally Left Blank						HCM Results									
	Terrain	SW (ft)	LW (ft)	Seg. Length (mi)**	PHF	Truck/ Bus %	Rec. Veh %***	% NPZ	Access Point Density	Analysis Direction Volume	Opposing Direction Volume	BFFS (mph)	FFS (mph)							V/C Ratio	PTSF	Average Speed (mph)	PFFS	Hwy Class	LOS				
TLNB1	Level	2.5	11.5	1.0	0.95	7%	0%	100%	14	561	407	50	43.5							0.35	77.9%	33.0	75.8%	III	C				
TLSB1	Level	2.5	11.5	1.0	0.95	7%	0%	100%	14	407	561	50	43.5							0.26	63.3%	33.7	77.4%	III	C				
TLNB2	Level	2.5	11.5	1.0	0.92	7%	0%	60%	14	686	836	50	43.5							0.44	78.1%	29.9	68.8%	III	D				
TLSB2	Level	2.5	11.5	1.0	0.92	7%	0%	60%	14	836	686	50	43.5							0.53	85.0%	29.7	68.3%	III	D				
TLNB3	Level	6.0	12.0	1.0	0.92	10%	0%	20%	8	155	472	50	48.0							0.11	30.2%	41.8	87.2%	III	B				
TLSB3	Level	6.0	12.0	1.0	0.92	10%	0%	20%	8	472	155	50	48.0							0.31	64.1%	41.7	86.8%	III	B				
TLNB4	Level	1.0	12.0	1.0	0.90	7%	0%	100%	30	452	581	55	43.3							0.30	68.3%	32.7	75.4%	III	C				
TLSB4	Level	1.0	12.0	1.0	0.90	7%	0%	100%	30	581	4																		

2023 BUILD ALT 4 (DIAMOND ROUNDABOUT) AM PEAK HOUR
HIGHWAY CAPACITY MANUAL ANALYSIS RESULTS

LOS	Density (pc/mi/ln)		PFBS (%)	Delay (s/veh)		
	M or D	FS		TWSC	SIGNAL	ROUNDABOUT
A	≤ 10	≤ 11	> 91.7	≤ 10	≤ 10	≤ 10
B	>10-20	>11-18	> 83.3 - 91.7	> 10-15	> 10-20	> 10-15
C	>20-28	>18-26	> 75.0 - 83.3	> 15-25	> 20-35	> 15-25
D	>28-35	>26-35	> 66.7 - 75.0	> 25-35	> 35-55	> 25-35
E	>35	>35-45	≤ 66.7	> 35-50	> 55-80	> 35-50
F	---	> 45	---	> 50	> 80	> 50
Symbol						

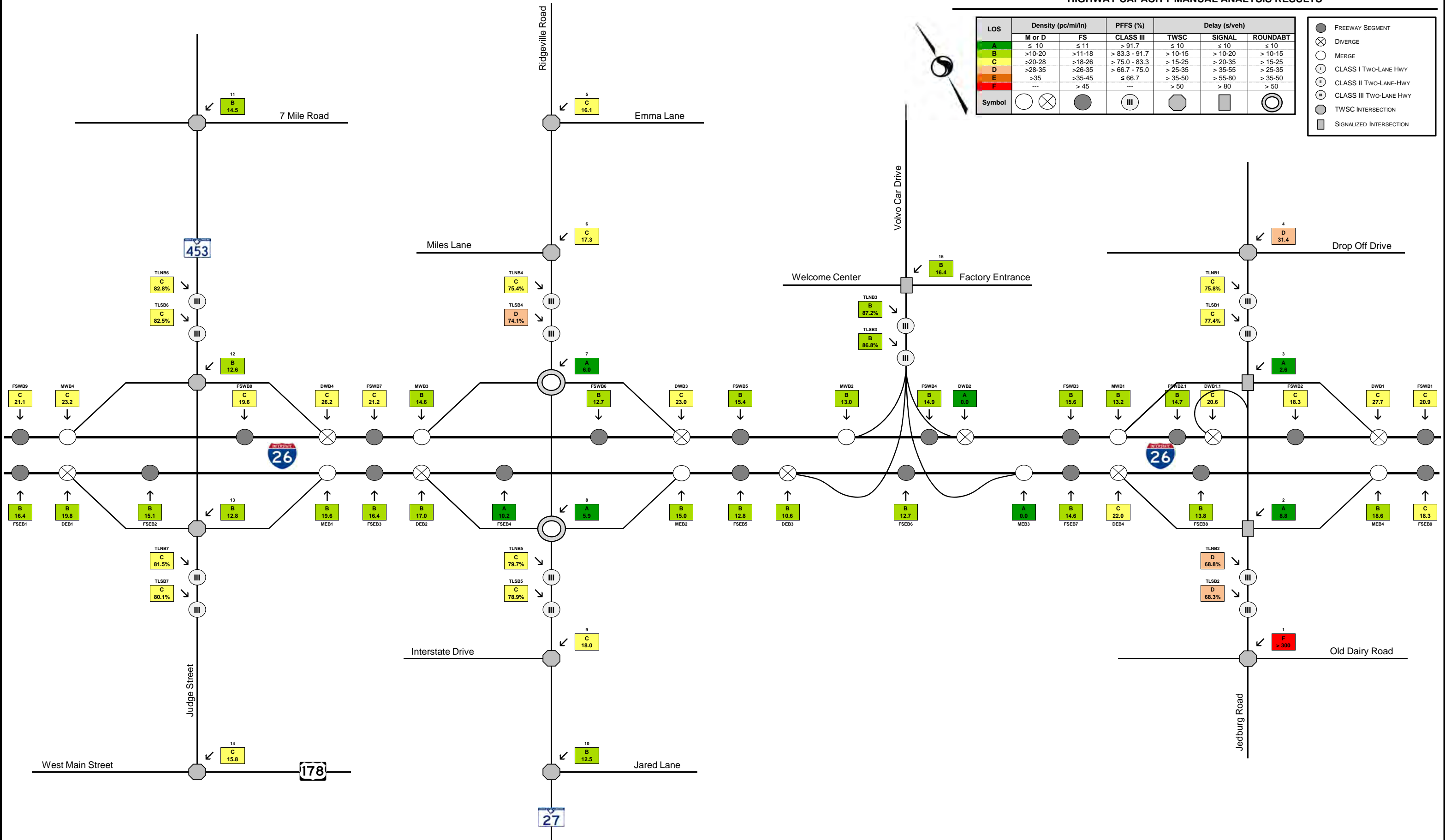
- FREEWAY SEGMENT
- ⊗ DIVERGE
- MERGE
- ⊖ CLASS I TWO-LANE HWY
- ⊖ CLASS II TWO-LANE HWY
- ⊖ CLASS III TWO-LANE HWY
- ⊖ TWSC INTERSECTION
- ▭ SIGNALIZED INTERSECTION



2023 BUILD ALT 4 (DIAMOND ROUNDABOUT) PM PEAK HOUR
HIGHWAY CAPACITY MANUAL ANALYSIS RESULTS

LOS	Density (pc/mi/ln)		PFFS (%)	Delay (s/veh)		
	M or D	FS		TWSC	SIGNAL	ROUNDABT
A	≤ 10	≤ 11	> 91.7	≤ 10	≤ 10	≤ 10
B	>10-20	>11-18	> 83.3 - 91.7	> 10-15	> 10-20	> 10-15
C	>20-28	>18-26	> 75.0 - 83.3	> 15-25	> 20-35	> 15-25
D	>28-35	>26-35	> 66.7 - 75.0	> 25-35	> 35-55	> 25-35
E	>35	>35-45	≤ 66.7	> 35-50	> 55-80	> 35-50
F	---	> 45	---	> 50	> 80	> 50
Symbol						

- FREEWAY SEGMENT
- DIVERGE
- MERGE
- CLASS I TWO-LANE HWY
- CLASS II TWO-LANE-HWY
- CLASS III TWO-LANE HWY
- TWSC INTERSECTION
- SIGNALIZED INTERSECTION



June 2019

B.11 2043 BUILD – ALTERNATIVE 4

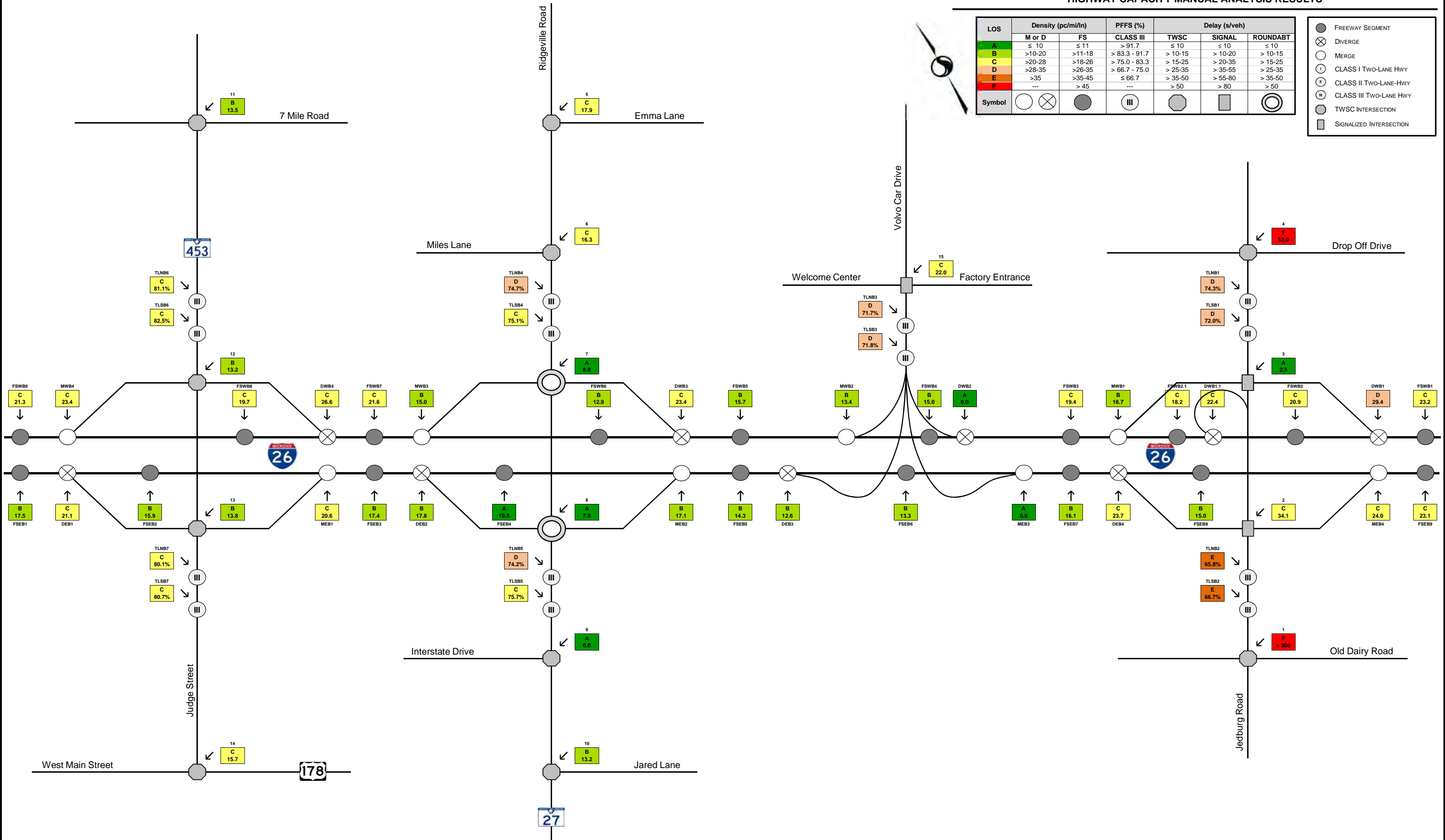


LOS	Density (pc/mi/ln)		PFFS (%)	Delay (s/veh)		I-26 Widening (MM 187 - MM 194) 2043 Build Alt 4 (Diamond_Rbt) PM Peak Hour - HCM Analysis Results Performance Measures <div><div><div><div></div><div>Stantec</div></div><div>December, 2018</div></div></div>																Notes:							
	M or D	FS	CLASS III HWY	TWSC	SIGNAL																	FS	=	Freeway Segment	M	=	Merge Area	D	=
A	≤ 10	≤ 11	> 91.7	≤ 10	≤ 10																								
B	>10-20	>11-18	> 83.3 - 91.7	> 10-15	> 10-20																								
C	>20-28	>18-26	> 75.0 - 83.3	> 15-25	> 20-35																								
D	>28-35	>26-35	> 66.7 - 75.0	> 25-35	> 35-55																								
E	>35	>35-45	≤ 66.7	> 35-50	> 55-80																								
F	---	> 45	---	> 50	> 80																								
I-26 Section	Ramp Information										Mainline Information										HCM Results								
	Volume (veh/hr)	% HV	PHF	Length A/D lane (ft)	FFS**** (MPH)	Adj. Ramp Up/Down	Adj. Ramp Volume (veh/hr)	Adj. Ramp Distance (ft)	Adj. Ramp HV%	Adj. Ramp PHF	Volume (veh/hr)	% HV	PHF	No. of Lanes	Terrain	Driver Pop Factor	LW (ft)	LC (ft)	TRD (ramp/mi)	FFS (mph)	Flow Rate (pc/h/ln)	Average Speed (mph)	Density (pc/mi/ln)	Type	LOS				
FSEB1	---	---	---	---	---	---	---	---	---	---	2,617	10%	0.92	2	Level	1.00	12	6	1.00	72.2	1,493	69.0	21.6	FS	C				
DEB1	37	52%	0.90	465	35	Down/On	194	1,850	24%	0.90	2,617	10%	0.92	2	---	---	---	---	---	---	---	57.9	25.8	D	C				
FSEB2	---	---	---	---	---	---	---	---	---	---	2,580	10%	0.92	2	Level	1.00	12	6	0.33	74.1	1,472	72.5	20.3	FS	C				
MEB1	194	24%	0.90	800	35	Up/Off	37	1,850	52%	0.90	2,580	10%	0.92	2	---	---	---	---	---	---	---	60.0	25.0	M	C				
FSEB3	---	---	---	---	---	---	---	---	---	---	2,774	10%	0.92	2	Level	1.00	12	6	0.00	75.4	1,583	71.2	22.2	FS	C				
DEB2	191	14%	0.90	250	35	Down/On	703	4,000	9%	0.90	2,774	10%	0.92	3	---	---	---	---	---	---	---	57.5	20.9	D	C				
FSEB4	---	---	---	---	---	---	---	---	---	---	2,583	10%	0.92	3	Level	1.00	12	6	0.67	73.1	983	75.0	13.1	FS	B				
MEB2	703	9%	0.90	900	35	Up/Off	191	4,000	14%	0.90	2,583	10%	0.92	3	---	---	---	---	---	---	---	61.0	19.7	M	B				
FSEB5	---	---	---	---	---	---	---	---	---	---	3,286	10%	0.92	3	Level	1.00	12	6	0.67	73.1	1,250	74.3	16.8	FS	B				
DEB3	86	10%	0.92	1,200	35	Down/On	623	3,500	10%	0.92	3,286	10%	0.92	3	---	---	---	---	---	---	---	57.8	15.1	D	B				
FSEB6	---	---	---	---	---	---	---	---	---	---	3,200	10%	0.92	3	Level	1.00	12	6	0.67	73.1	1,217	74.5	16.3	FS	B				
MEB3	623	10%	0.92	2,000	35	Up/Off	86	3,500	10%	0.92	3,200	10%	0.92	3	---	---	---	---	---	---	---	68.0	0.0	M	A				
FSEB7	---	---	---	---	---	---	---	---	---	---	3,823	10%	0.92	3	Level	1.00	12	6	0.67	73.1	1,454	72.7	20.0	FS	C				
DEB4	202	19%	0.91	180	35	Down/On	824	2,900	7%	0.90	3,823	10%	0.92	3	---	---	---	---	---	---	---	57.4	27.4	D	C				
FSEB8	---	---	---	---	---	---	---	---	---	---	3,621	10%	0.92	3	Level	1.00	12	6	0.50	73.6	1,378	73.4	18.8	FS	C				
MEB4	824	7%	0.90	1,120	35	Up/Off	202	2,900	19%	0.91	3,621	10%	0.92	3	---	---	---	---	---	---	---	60.0	25.0	M	C				
FSEB9	---	---	---	---	---	---	---	---	---	---	4,445	10%	0.92	3	Level	1.00	12	6	1.20	71.6	1,691	67.2	25.2	FS	C				
FSWB1	---	---	---	---	---	---	---	---	---	---	5,187	15%	0.93	3	Level	1.00	12	6	1.33	71.3	1,999	62.6	31.9	FS	D				
DWB1	355	6%	0.95	150	35	Down/Off	802	920	6%	0.95	5,187	15%	0.93	3	---	---	---	---	---	---	---	57.0	35.5	D	E				
FSWB2	---	---	---	---	---	---	---	---	---	---	4,832	15%	0.93	3	Level	1.00	12	6	0.67	73.1	1,862	66.8	27.9	FS	D				
DWB1.1	802	6%	0.95	850	35	Down/On	198	750	7%	0.90	4,832	15%	0.93	3	---	---	---	---	---	---	---	55.8	27.6	D	C				
FSWB2.1	---	---	---	---	---	---	---	---	---	---	4,030	15%	0.93	3	Level	1.00	12	6	0.67	73.1	1,553	71.6	21.7	FS	C				
MWB1	198	7%	0.90	1,650	35	Up/Off	808	750	6%	0.95	4,030	15%	0.93	3	---	---	---	---	---	---	---	62.0	19.4	M	B				
FSWB3	---	---	---	---	---	---	---	---	---	---	4,228	15%	0.93	3	Level	1.00	12	6	0.67	73.1	1,629	70.6	23.1	FS	C				
DWB2	347	10%	0.92	3,000	35	Down/On	156	2,400	10%	0.92	4,228	15%	0.93	3	---	---	---	---	---	---	---	57.0	0.0	D	A				
FSWB4	---	---	---	---	---	---	---	---	---	---	3,881	15%	0.93	3	Level	1.00	12	6	0.67	73.1	1,495	72.3	20.7	FS	C				
MWB2	156	10%	0.92	1,800	35	Up/Off	347	2,400	10%	0.92	3,881	15%	0.93	3	---	---	---	---	---	---	---	62.0	19.1	M	B				
FSWB5	---	---	---	---	---	---	---	---	---	---	4,037	15%	0.93	3	Level	1.00	12	6	0.67	73.1	1,555	71.6	21.7	FS	C				
DWB3	689	10%	0.91	250	35	Down/On	218	3,300	13%	0.90	4,037	15%	0.93	3	---	---	---	---	---	---	---	56.0	29.0	D	D				
FSWB6	---	---	---	---	---	---	---	---	---	---	3,348	15%	0.93	3	Level	1.00	12	6	0.67	73.1	1,290	74.1	17.4	FS	B				
MWB3	218	13%	0.90	900	35	Up/Off	689	3,300	10%	0.91	3,348	15%	0.93	3	---	---	---	---	---	---	---	61.0	19.9	M	B				
FSWB7	---	---	---	---	---	---	---	---	---	---	3,566	15%	0.93	2	Level	1.00	12	6	0.00	75.4	2,061	62.5	33.0	FS	D				
DWB4	198	21%	0.90	475	35	Down/On	69	1,850	24%	0.90	3,566	15%	0.93	2	---	---	---	---	---	---	---	57.4	35.4	D	E				
FSWB8	---	---	---	---	---	---	---	---	---	---	3,368	15%	0.93	2	Level	1.00	12	6	0.33	74.1	1,947	65.1	29.9	FS	D				
MWB4	69	24%	0.90	800	35	Up/Off	198	1,850	21%	0.90	3,368	15%	0.93	2	---	---	---	---	---	---	---	57.0	31.5	M	D				
FSWB9	---	---	---	---	---	---	---	---	---	---	3,437	15%	0.93	2	Level	1.00	12	6	1.00	72.2	1,986	62.8	31.6	FS	D				
Two-Lane Side-Street Section	Segment Information													Intentionally Left Blank						HCM Results									
	Terrain	SW (ft)	LW (ft)	Seg. Length (mi)**	PHF	Truck/ Bus %	Rec. Veh %***	% NPZ	Access Point Density	Analysis Direction Volume	Opposing Direction Volume	BFFS (mph)	FFS (mph)							V/C Ratio	PTSF	Average Speed (mph)	PFFS	Hwy Class	LOS				
TLNB1	Level	2.5	11.5	1.0	0.95	7%	0%	100%	14	718	521	50	43.5							0.45	82.4%	31.3	71.9%	III	D				
TLSB1	Level	2.5	11.5	1.0	0.95	7%	0%	100%	14	521	718	50	43.5							0.33	69.6%	32.0	73.5%	III	D				
TLNB2	Level	2.5	11.5	1.0	0.92	7%	0%	60%	14	877	1,069	50	43.5							0.56	85.3%	26.5	60.9%	III	E				
TLSB2	Level	2.5	11.5	1.0	0.92	7%	0%	60%	14	1,069	8																		

2043 BUILD ALT 4 (DIAMOND ROUNDABOUT) AM PEAK HOUR
HIGHWAY CAPACITY MANUAL ANALYSIS RESULTS

LOS	Density (pc/mi/ln)		PFFS (%)	Delay (s/veh)		
	M or D	FS		TWSC	SIGNAL	ROUNDABT
A	≤ 10	≤ 11	> 91.7	≤ 10	≤ 10	≤ 10
B	>10-20	>11-18	> 83.3 - 91.7	> 10-15	> 10-20	> 10-15
C	>20-28	>18-26	> 75.0 - 83.3	> 15-25	> 20-35	> 15-25
D	>28-35	>26-35	> 66.7 - 75.0	> 25-35	> 35-55	> 25-35
E	>35	>35-45	≤ 66.7	> 35-50	> 55-80	> 35-50
F	---	> 45	---	> 50	> 80	> 50
Symbol	○	⊗	●	⦶	■	⦶

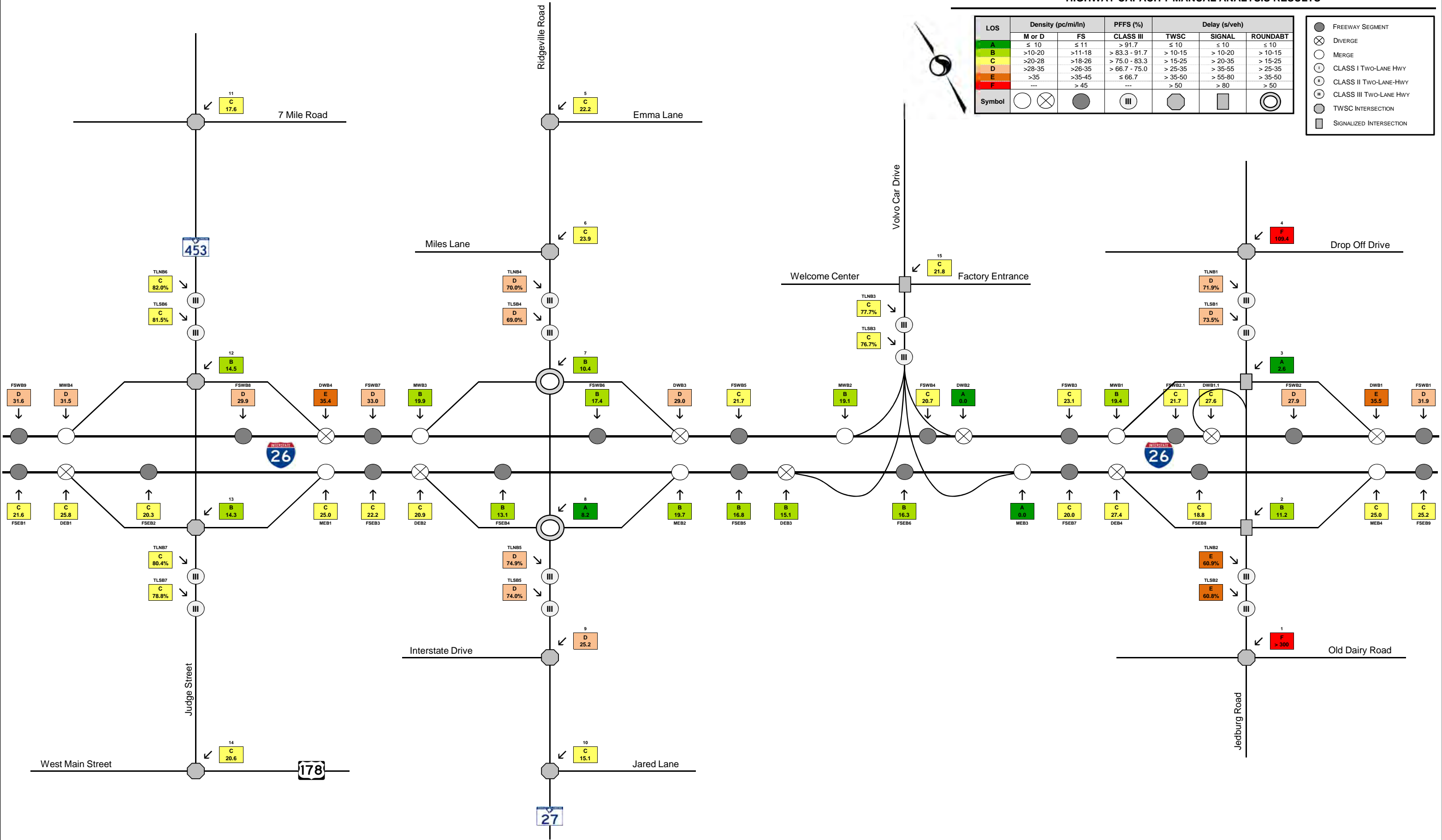
- FREEWAY SEGMENT
- ⊗ DIVERGE
- MERGE
- ⦶ CLASS I TWO-LANE HWY
- ⦶ CLASS II TWO-LANE-HWY
- ⦶ CLASS III TWO-LANE HWY
- TWSC INTERSECTION
- SIGNALIZED INTERSECTION



2043 BUILD ALT 4 (DIAMOND ROUNDABOUT) PM PEAK HOUR
HIGHWAY CAPACITY MANUAL ANALYSIS RESULTS

LOS	Density (pc/mi/ln)		PFBS (%)	Delay (s/veh)		
	M or D	FS		TWSC	SIGNAL	ROUNDABT
A	≤ 10	≤ 11	> 91.7	≤ 10	≤ 10	≤ 10
B	>10-20	>11-18	> 83.3 - 91.7	> 10-15	> 10-20	> 10-15
C	>20-28	>18-26	> 75.0 - 83.3	> 15-25	> 20-35	> 15-25
D	>28-35	>26-35	> 66.7 - 75.0	> 25-35	> 35-55	> 25-35
E	>35	>35-45	≤ 66.7	> 35-50	> 55-80	> 35-50
F	---	> 45	---	> 50	> 80	> 50
Symbol						

- FREEWAY SEGMENT
- DIVERGE
- MERGE
- CLASS I TWO-LANE HWY
- CLASS II TWO-LANE-HWY
- CLASS III TWO-LANE HWY
- TWSC INTERSECTION
- SIGNALIZED INTERSECTION



June 2019

Appendix C HCS ANALYSIS RESULTS

C.1 2018 EXISTING



HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1330	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	53	vph
Length of first accel/decel lane	465	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	136	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1330	53	136	vph
Peak-hour factor, PHF	0.91	0.95	0.81	

Peak 15-min volume, v_{15}	365	14	42	v
Trucks and buses	24	53	36	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.791	0.847	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	1637	71	198	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 1637$ pc/h

$v_{12} = 1637$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	1637	4800	No
$v_{12} = v_F$			
$v_{12} = v_F - v_R$	1566	4800	No
$v_{12} = v_F - v_R$			
$v_{12} = v_F$	71	2000	No
$v_{12} = v_F$			
$v_{12} = v_F$ or $v_{12} = v_R$	0 pc/h	(Equation 13-14 or 13-17)	
$v_{12} = v_F$ or $v_{12} = v_R$			
Is $v_{12} = v_F$ or $v_{12} = v_R$ > 2700 pc/h?		No	
Is $v_{12} = v_F$ or $v_{12} = v_R$ > 1.5 $v_{12} / 2$		No	
If yes, $v_{12} = 1637$		(Equation 13-15, 13-16, 13-18, or 13-19)	
$v_{12} = 1637$			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1637	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 14.1$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.434$

S

Space mean speed in ramp influence area, $S = 57.8$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 57.8 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1413	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	109	vph
Length of first accel/decel lane	450	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	466	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1413	109	466	vph
Peak-hour factor, PHF	0.91	0.82	0.89	

Peak 15-min volume, v_{15}	388	33	131	v
Trucks and buses	24	23	16	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.897	0.926	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	1739	148	565	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 1739$ pc/h

$v_{12} = 1739$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	1739	4800	No
$v_{12} = v_F - v_R$	1591	4800	No
$v_{12} = v_R$	148	2000	No
$v_{12} \text{ or } v_{12}$	0 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_{12} > 2700$ pc/h?		No	
Is $v_{12} \text{ or } v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 1739$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1739	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 15.2$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.441$

S

Space mean speed in ramp influence area, $S = 57.6$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 57.6 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1770	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	0	vph
Length of first accel/decel lane	1200	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	0	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	3500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent
		Ramp	
Volume, V (vph)	1770	0	0 vph
Peak-hour factor, PHF	0.91	0.92	0.92

Peak 15-min volume, v_{15}	486	0	0	v
Trucks and buses	24	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2178	0	0	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 2178$ pc/h

$v_{12} = 2178$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	2178	4800	No
$v_{12} = v_F$			
$v_{12} = v_F - v_R$	2178	4800	No
$v_{12} = v_F - v_R$			
$v_{12} = v_F$	0	2000	No
$v_{12} = v_F$			
$v_{12} = v_F$ or $v_{12} = v_R$	0 pc/h	(Equation 13-14 or 13-17)	
$v_{12} = v_F$ or $v_{12} = v_R$			
Is $v_{12} = v_F$ or $v_{12} = v_R$ > 2700 pc/h?		No	
Is $v_{12} = v_F$ or $v_{12} = v_R$ > 1.5 $v_{12} / 2$		No	
If yes, $v_{12} = 2178$		(Equation 13-15, 13-16, 13-18, or 13-19)	
$v_{12} = 2178$			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2178	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 12.2$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.428$

S

Space mean speed in ramp influence area, $S = 58.0$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 58.0 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1770	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	134	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	804	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1600	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1770	134	804	vph
Peak-hour factor, PHF	0.91	0.64	0.86	

Peak 15-min volume, v_{15}	486	52	234	v
Trucks and buses	24	29	11	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.873	0.948	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2178	240	986	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 2178$ pc/h

$v_{12} = 2178$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	2178	4800	No
$v_{12} = v_F - v_R$	1938	4800	No
$v_{12} = v_R$	240	2000	No
$v_{12} \text{ or } v_{12}$	0 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_{12} > 2700$ pc/h?		No	
Is $v_{12} \text{ or } v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 2178$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2178	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 18.5$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.450$

S

Space mean speed in ramp influence area, $S = 57.4$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 57.4 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2377	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	435	vph
Length of first accel/decel lane	465	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	140	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1600	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2377	435	140	vph
Peak-hour factor, PHF	0.92	0.86	0.78	

Peak 15-min volume, v_{15}	646	126	45	v
Trucks and buses	22	10	11	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.952	0.948	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2868	531	189	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 2868$ pc/h

$v_{12} = 2868$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	2868	4800	No
$v_{12} = v_F$			
$v_{12} = v_F - v_R$	2337	4800	No
$v_{12} = v_F - v_R$			
$v_{12} = v_F$	531	2000	No
$v_{12} = v_F$			
$v_{12} = v_F$ or $v_{12} = v_R$	0 pc/h	(Equation 13-14 or 13-17)	
$v_{12} = v_F$ or $v_{12} = v_R$			
Is $v_{12} = v_F$ or $v_{12} = v_R$ > 2700 pc/h?		No	
Is $v_{12} = v_F$ or $v_{12} = v_R$ > 1.5 $v_{12} / 2$		No	
If yes, $v_{12} = 2868$		(Equation 13-15, 13-16, 13-18, or 13-19)	
$v_{12} = 2868$			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2868	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 24.7$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.476$

S

Space mean speed in ramp influence area, $S = 56.7$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 56.7 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2082	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	0	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane	1500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	0	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent
		Ramp	
Volume, V (vph)	2082	0	0 vph
Peak-hour factor, PHF	0.92	0.92	0.92

Peak 15-min volume, v_{15}	566	0	0	v
Trucks and buses	22	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2512	0	0	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 2512$ pc/h

$v_{12} = 2512$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	2512	4800	No
$v_{12} = v_F$			
$v_{12} = v_F - v_R$	2512	4800	No
$v_{12} = v_F - v_R$			
$v_{12} = v_F$	0	4000	No
$v_{12} = v_F$			
$v_{12} = v_F$ or $v_{12} = v_R$	0 pc/h	(Equation 13-14 or 13-17)	
$v_{12} = v_F$ or $v_{12} = v_R$			
Is $v_{12} = v_F$ or $v_{12} = v_R$ > 2700 pc/h?		No	
Is $v_{12} = v_F$ or $v_{12} = v_R$ > 1.5 $v_{12} / 2$		No	
If yes, $v_{12} = 2512$		(Equation 13-15, 13-16, 13-18, or 13-19)	
$v_{12} = 2512$			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2512	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = -14.6$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable, $D = 0.428$

S

Space mean speed in ramp influence area, $S = 58.0$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 58.0 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2082	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	346	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	107	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2082	346	107	vph
Peak-hour factor, PHF	0.92	0.94	0.84	

Peak 15-min volume, v_{15}	566	92	32	v
Trucks and buses	22	25	16	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.889	0.926	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2512	414	138	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 2512$ pc/h

$v_{12} = 2512$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	2512	4800	No
$v_{12} = v_F - v_R$	2098	4800	No
$v_{12} = v_F$	414	2000	No
$v_{12} \text{ or } v_R$	0 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_R > 2700$ pc/h?		No	
Is $v_{12} \text{ or } v_R > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 2512$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2512	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 21.4$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.465$

S

Space mean speed in ramp influence area, $S = 57.0$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 57.0 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1843	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	153	vph
Length of first accel/decel lane	475	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	52	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1843	153	52	vph
Peak-hour factor, PHF	0.92	0.88	0.92	

Peak 15-min volume, v_{15}	501	43	14	v
Trucks and buses	22	46	36	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.813	0.847	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2224	214	67	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 2224$ pc/h

$v_{12} = 2224$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	2224	4800	No
$v_{12} = v_F$			
$v_{12} = v_F - v_R$	2010	4800	No
$v_{12} = v_F - v_R$			
$v_{12} = v_F$	214	2000	No
$v_{12} = v_F$			
$v_{12} = v_F$ or $v_{12} = v_R$	0 pc/h	(Equation 13-14 or 13-17)	
$v_{12} = v_F$ or $v_{12} = v_R$			
Is $v_{12} = v_F$ or $v_{12} = v_R$ > 2700 pc/h?		No	
Is $v_{12} = v_F$ or $v_{12} = v_R$ > 1.5 $v_{12} / 2$		No	
If yes, $v_{12} = 2224$		(Equation 13-15, 13-16, 13-18, or 13-19)	
$v_{12} = 2224$			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2224	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 19.1$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.447$

S

Space mean speed in ramp influence area, $S = 57.5$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 57.5 mph

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: West of SC 453
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1330	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	365	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	818	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.2	mi/h
Free-flow speed, FFS	72.2	mi/h

LOS and Performance Measures

Flow rate, vp	818	pc/h/ln
Free-flow speed, FFS	72.2	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	2	
Density, D	11.7	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Between SC 453 Ramps
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1277	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	351	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	786	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.33	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.3	mi/h
Free-flow speed, FFS	74.1	mi/h

LOS and Performance Measures

Flow rate, vp	786	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	2	
Density, D	10.5	pc/mi/ln
Level of service, LOS	A	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: SC 453 to SC 27
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1413	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	388	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	870	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	870	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	2	
Density, D	11.6	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Between SC 27 Ramps
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1304	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	358	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	802	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.30	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.2	mi/h
Free-flow speed, FFS	74.2	mi/h

LOS and Performance Measures

Flow rate, vp	802	pc/h/ln
Free-flow speed, FFS	74.2	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	2	
Density, D	10.7	pc/mi/ln
Level of service, LOS	A	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Between SC 27 & Volvo
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1770	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	486	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	1089	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	1089	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	74.9	mi/h
Number of lanes, N	2	
Density, D	14.5	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Between Volvo Ramps
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1770	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	486	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	1089	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	1089	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	74.9	mi/h
Number of lanes, N	2	
Density, D	14.5	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Volvo to Jedburg
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1770	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	486	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	1089	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	1089	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	74.9	mi/h
Number of lanes, N	2	
Density, D	14.5	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1636	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	449	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	1007	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.50	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.8	mi/h
Free-flow speed, FFS	73.6	mi/h

LOS and Performance Measures

Flow rate, vp	1007	pc/h/ln
Free-flow speed, FFS	73.6	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	2	
Density, D	13.4	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Jedburg to Nexton
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2440	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	670	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	1502	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.20	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.8	mi/h
Free-flow speed, FFS	71.6	mi/h

LOS and Performance Measures

Flow rate, vp	1502	pc/h/ln
Free-flow speed, FFS	71.6	mi/h
Average passenger-car speed, S	68.9	mi/h
Number of lanes, N	2	
Density, D	21.8	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Nexton to Jedburg
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2377	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	646	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1434	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.20	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.8	mi/h
Free-flow speed, FFS	71.6	mi/h

LOS and Performance Measures

Flow rate, vp	1434	pc/h/ln
Free-flow speed, FFS	71.6	mi/h
Average passenger-car speed, S	69.4	mi/h
Number of lanes, N	2	
Density, D	20.7	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1942	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	528	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1172	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.50	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.8	mi/h
Free-flow speed, FFS	73.6	mi/h

LOS and Performance Measures

Flow rate, vp	1172	pc/h/ln
Free-flow speed, FFS	73.6	mi/h
Average passenger-car speed, S	74.7	mi/h
Number of lanes, N	2	
Density, D	15.7	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Jedburg to Volvo
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2082	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	566	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1256	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	1256	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	74.3	mi/h
Number of lanes, N	2	
Density, D	16.9	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between Volvo Ramps
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2082	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	566	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1256	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	1256	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	74.3	mi/h
Number of lanes, N	2	
Density, D	16.9	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between Volvo & SC 27
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2082	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	566	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1256	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	1256	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	74.3	mi/h
Number of lanes, N	2	
Density, D	16.9	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between SC 27 Ramps
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1736	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	472	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1047	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.33	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.3	mi/h
Free-flow speed, FFS	74.1	mi/h

LOS and Performance Measures

Flow rate, vp	1047	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	2	
Density, D	14.0	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: SC 27 to SC 453
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1843	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	501	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1112	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	1112	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	74.9	mi/h
Number of lanes, N	2	
Density, D	14.9	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between SC 453 Ramps
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1690	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	459	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1020	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.33	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.3	mi/h
Free-flow speed, FFS	74.1	mi/h

LOS and Performance Measures

Flow rate, vp	1020	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	2	
Density, D	13.6	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: West of SC 453
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1742	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	473	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1051	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.2	mi/h
Free-flow speed, FFS	72.2	mi/h

LOS and Performance Measures

Flow rate, vp	1051	pc/h/ln
Free-flow speed, FFS	72.2	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	2	
Density, D	15.0	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1277	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	136	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	53	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1277	136	53	vph
Peak-hour factor, PHF	0.91	0.81	0.95	

Peak 15-min volume, v ₁₅	351	42	14	v
Trucks and buses	24	36	53	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.893	0.847	0.791	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	1572	198	71	pcph

Estimation of V₁₂ Merge Areas

L = (Equation 13-6 or 13-7)

EQ

P = 1.000 Using Equation 0

FM

v = v_p (P) = 1572 pc/h

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v	1770	4800	No
FO			
v or v ₃	0 pc/h	(Equation 13-14 or 13-17)	
av ₃₄			
Is v or v ₃	> 2700 pc/h?	No	
av ₃₄			
Is v or v ₃	> 1.5 v ₁₂ / 2	No	
av ₃₄	12		
If yes, v _{12A}	= 1572	(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v	1770	4600	No
R ₁₂			

Level of Service Determination (if not F)

Density, D = $5.475 + 0.00734 v_R + 0.0078 v_A - 0.00627 L$ = 14.2 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, M = 0.288

S

Space mean speed in ramp influence area, S = 61.9 mph

R

Space mean speed in outer lanes, S = N/A mph

0

Space mean speed for all vehicles, S = 61.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1304	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	466	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	109	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1304	466	109	vph
Peak-hour factor, PHF	0.91	0.89	0.82	

Peak 15-min volume, v_{15}	358	131	33	v
Trucks and buses	24	16	23	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.926	0.897	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	1605	565	148	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)

EQ

$P = 1.000$ Using Equation 0

FM

$v_{12} = v_{12} (P) = 1605$ pc/h

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	2170	4800	No
FO			
v_{12} or v_{12}	0 pc/h	(Equation 13-14 or 13-17)	
$\frac{v_{12}}{3}$ av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
$\frac{v_{12}}{3}$ av34			
Is v_{12} or v_{12}	$> 1.5 v_{12} / 2$	No	
$\frac{v_{12}}{3}$ av34	12		
If yes, $v_{12} = 1605$	(Equation 13-15, 13-16, 13-18, or 13-19)		
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2170	4600	No
R12			

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 17.1$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.299$

S

Space mean speed in ramp influence area, $S = 61.6$ mph

R

Space mean speed in outer lanes, $S = N/A$ mph

0

Space mean speed for all vehicles, $S = 61.6$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1770	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-flow speed on ramp	35.0	mph
Volume on ramp	0	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane	1500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	0	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	3500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent
		Ramp	
Volume, V (vph)	1770	0	0 vph
Peak-hour factor, PHF	0.91	0.92	0.92

Peak 15-min volume, v ₁₅	486	0	0	v
Trucks and buses	24	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.893	0.952	0.952	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	2178	0	0	pcph

Estimation of V12 Merge Areas

L = (Equation 13-6 or 13-7)

EQ

P = 1.000 Using Equation 0

FM

v = v₁₂ (P_{FM}) = 2178 pc/h

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v _{FO}	2178	4800	No
v ₃ or v _{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v ₃ or v _{av34} > 2700 pc/h?		No	
Is v ₃ or v _{av34} > 1.5 v ₁₂ / 2		No	
If yes, v _{12A} = 2178		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v _{R12}	2178	4600	No

Level of Service Determination (if not F)

Density, D = $5.475 + 0.00734 v_R + 0.0078 v_A - 0.00627 L$ = -5.8 pc/mi/ln

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable, M = 0.040

S

Space mean speed in ramp influence area, S_R = 68.9 mph

R

Space mean speed in outer lanes, S₀ = N/A mph

0

Space mean speed for all vehicles, S = 68.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1636	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	804	vph
Length of first accel/decel lane	1120	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	134	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1600	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1636	804	134	vph
Peak-hour factor, PHF	0.91	0.86	0.64	

Peak 15-min volume, v_{15}	449	234	52	v
Trucks and buses	24	11	29	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.948	0.873	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2014	986	240	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)

EQ

$P = 1.000$ Using Equation 0

FM

$v_{12} = v_{15} (P) = 2014$ pc/h

FM

Capacity Checks

v_{12}	Actual 3000	Maximum 4800	LOS F? No
FO			
v_{12} or v_{15}	0 pc/h	(Equation 13-14 or 13-17)	
$\frac{v_{12}}{3}$ or $\frac{v_{15}}{3}$			
Is $\frac{v_{12}}{3}$ or $\frac{v_{15}}{3} > 2700$ pc/h?		No	
Is $\frac{v_{12}}{3}$ or $\frac{v_{15}}{3} > 1.5 \frac{v_{12}}{12}$		No	
If yes, $v_{12} = 2014$		(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

v_{12}	Actual 3000	Max Desirable 4600	Violation? No
R12			

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 \frac{v_{12}}{R} + 0.0078 \frac{v_{15}}{A} - 0.00627 L = 21.4$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $M = 0.321$

S

Space mean speed in ramp influence area, $S = 61.0$ mph

R

Space mean speed in outer lanes, $S = N/A$ mph

0

Space mean speed for all vehicles, $S = 61.0$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1942	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	140	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	435	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1600	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1942	140	435	vph
Peak-hour factor, PHF	0.92	0.78	0.86	

Peak 15-min volume, v_{15}	528	45	126	v
Trucks and buses	22	11	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.948	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2343	189	531	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)

EQ

$P = 1.000$ Using Equation 0

FM

$v_{12} = v_{12} (P) = 2343$ pc/h

FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	2532	4800	No
FO			
v_{12} or v_{12}	0 pc/h	(Equation 13-14 or 13-17)	
v_{12} or v_{12}			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
Is v_{12} or v_{12}	> 1.5 $v_{12} / 2$	No	
If yes, v_{12}	= 2343	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2532	4600	No
R12			

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 20.1$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $M = 0.314$

S

Space mean speed in ramp influence area, $S = 61.2$ mph

R

Space mean speed in outer lanes, $S = N/A$ mph

0

Space mean speed for all vehicles, $S = 61.2$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2082	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	0	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	0	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent
		Ramp	
Volume, V (vph)	2082	0	0 vph
Peak-hour factor, PHF	0.92	0.92	0.92

Peak 15-min volume, v_{15}	566	0	0	v
Trucks and buses	22	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2512	0	0	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)

EQ

$P = 1.000$ Using Equation 0

FM

$v_{12} = v_{15} (P_{FM}) = 2512$ pc/h

12 F FM

Capacity Checks

v_{12}	Actual 2512	Maximum 4800	LOS F? No
FO			
v_{12} or v_{15}	0 pc/h	(Equation 13-14 or 13-17)	
$\frac{v_{12}}{3}$ or $\frac{v_{15}}{3}$			
Is $\frac{v_{12}}{3}$ or $\frac{v_{15}}{3} > 2700$ pc/h?		No	
Is $\frac{v_{12}}{3}$ or $\frac{v_{15}}{3} > 1.5 \frac{v_{12}}{12}$		No	
If yes, $v_{12} = 2512$		(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

v_{12}	Actual 2512	Max Desirable 4600	Violation? No
R12			

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 \frac{v_{12}}{R} + 0.0078 \frac{v_{15}}{A} - 0.00627 L = 15.7$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.264$

S

Space mean speed in ramp influence area, $S_R = 62.6$ mph

R

Space mean speed in outer lanes, $S_0 = N/A$ mph

0

Space mean speed for all vehicles, $S = 62.6$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1736	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	107	vph
Length of first accel/decel lane	900	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	346	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1736	107	346	vph
Peak-hour factor, PHF	0.92	0.84	0.94	

Peak 15-min volume, v ₁₅	472	32	92	v
Trucks and buses	22	16	25	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.901	0.926	0.889	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	2095	138	414	pcph

Estimation of V₁₂ Merge Areas

L = (Equation 13-6 or 13-7)

EQ

P = 1.000 Using Equation 0

FM

v = v₁₂ (P) = 2095 pc/h

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v	2233	4800	No
FO			
v or v ₃	0 pc/h	(Equation 13-14 or 13-17)	
av ₃₄			
Is v or v ₃	> 2700 pc/h?	No	
av ₃₄			
Is v or v ₃	> 1.5 v ₁₂ / 2	No	
av ₃₄	12		
If yes, v _{12A}	= 2095	(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v	2233	4600	No
R ₁₂			

Level of Service Determination (if not F)

Density, D = $5.475 + 0.00734 v_R + 0.0078 v_A - 0.00627 L$ = 17.2 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, M = 0.294

S

Space mean speed in ramp influence area, S = 61.8 mph

R

Space mean speed in outer lanes, S = N/A mph

0

Space mean speed for all vehicles, S = 61.8 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1690	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	52	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	153	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1690	52	153	vph
Peak-hour factor, PHF	0.92	0.92	0.88	

Peak 15-min volume, v ₁₅	459	14	43	v
Trucks and buses	22	36	46	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.901	0.847	0.813	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	2039	67	214	pcph

Estimation of V₁₂ Merge Areas

L = (Equation 13-6 or 13-7)

EQ

P = 1.000 Using Equation 0

FM

v = v₁₂ (P) = 2039 pc/h

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v	2106	4800	No
FO			
v or v ₃	0 pc/h	(Equation 13-14 or 13-17)	
av ₃₄			
Is v or v ₃	> 2700 pc/h?	No	
av ₃₄			
Is v or v ₃	> 1.5 v ₁₂ / 2	No	
av ₃₄			
If yes, v _{12A}		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v	2106	4600	No
R ₁₂			

Level of Service Determination (if not F)

Density, D = $5.475 + 0.00734 v_R + 0.0078 v_A - 0.00627 L$ = 16.9 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, M = 0.297

S

Space mean speed in ramp influence area, S = 61.7 mph

R

Space mean speed in outer lanes, S = N/A mph

0

Space mean speed for all vehicles, S = 61.7 mph

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Jedburg Road (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2018
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.93
Shoulder width	2.5 ft	% Trucks and buses	11 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 327 veh/h
Opposing direction volume, Vo 523 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.3	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.968	0.989
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	363 pc/h	569 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	1.9	mi/h
Average travel speed, ATSD	34.3	mi/h
Percent Free Flow Speed, PFFS	78.9	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.989	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	355 pc/h	562 pc/h
Base percent time-spent-following,(note-4) BPTSFd	42.0	%
Adjustment for no-passing zones, fnp	37.7	
Percent time-spent-following, PTSFd	56.6	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.21
Peak 15-min vehicle-miles of travel, VMT15	88 veh-mi
Peak-hour vehicle-miles of travel, VMT60	327 veh-mi
Peak 15-min total travel time, TT15	2.6 veh-h
Capacity from ATS, CdATS	1681 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1681 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	34.3	mi/h
Percent time-spent-following, PTSFd (from above)	56.6	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 351.6
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 7.23
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Jedburg Road (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2018
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.94
Shoulder width	2.5 ft	% Trucks and buses	11 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	60 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 723 veh/h
Opposing direction volume, Vo 497 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.2
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.989	0.978
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	778 pc/h	541 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	1.5	mi/h
Average travel speed, ATSD	31.8	mi/h
Percent Free Flow Speed, PFFS	73.0	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	769 pc/h	529 pc/h
Base percent time-spent-following,(note-4) BPTSFd	65.6	%
Adjustment for no-passing zones, fnp	27.8	
Percent time-spent-following, PTSFd	82.1	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.46
Peak 15-min vehicle-miles of travel, VMT15	192 veh-mi
Peak-hour vehicle-miles of travel, VMT60	723 veh-mi
Peak 15-min total travel time, TT15	6.0 veh-h
Capacity from ATS, CdATS	1663 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1663 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	31.8	mi/h
Percent time-spent-following, PTSFd (from above)	82.1	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 769.1
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 7.63
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
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Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Volvo Car Drive (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2018
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	6.0 ft	% Trucks and buses	10 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	20 %
Up/down	- %	Access point density	8 /mi

Analysis direction volume, Vd 0 veh/h
Opposing direction volume, Vo 0 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.9	1.9
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.917	0.917
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	0 pc/h	0 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 0.0 mi/h
Adj. for access point density,(note-3) fA 2.0 mi/h

Free-flow speed, FFSd	48.0	mi/h
Adjustment for no-passing zones, fnp	0.2	mi/h
Average travel speed, ATSD	47.8	mi/h
Percent Free Flow Speed, PFFS	99.7	%

Percent Time-Spent-Following

Direction	Analysis(d)	Oposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.990	0.990
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	0 pc/h	0 pc/h
Base percent time-spent-following,(note-4) BPTSFd	0.0	%
Adjustment for no-passing zones, fnp	29.2	
Percent time-spent-following, PTSFd		%

Level of Service and Other Performance Measures

Level of service, LOS	
Volume to capacity ratio, v/c	0.00
Peak 15-min vehicle-miles of travel, VMT15	0 veh-mi
Peak-hour vehicle-miles of travel, VMT60	0 veh-mi
Peak 15-min total travel time, TT15	0.0 veh-h
Capacity from ATS, CdATS	1559 veh/h
Capacity from PTSF, CdPTSF	1683 veh/h
Directional Capacity	1559 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	47.8	mi/h
Percent time-spent-following, PTSFd (from above)		
Level of service, LOSd (from above)		

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 0.0
Effective width of outside lane, We 42.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS -4.00
Bicycle LOS A

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 27 (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2018
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.93
Shoulder width	1.0 ft	% Trucks and buses	16 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	30 /mi

Analysis direction volume, Vd 382 veh/h
Opposing direction volume, Vo 348 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.3	1.3
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.954	0.954
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	431 pc/h	392 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 7.5 mi/h

Free-flow speed, FFSd	43.3	mi/h
Adjustment for no-passing zones, fnp	2.8	mi/h
Average travel speed, ATSD	34.2	mi/h
Percent Free Flow Speed, PFFS	78.9	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	0.984
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	411 pc/h	380 pc/h
Base percent time-spent-following,(note-4) BPTSFd	42.9	%
Adjustment for no-passing zones, fnp	45.9	
Percent time-spent-following, PTSFd	66.7	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.25
Peak 15-min vehicle-miles of travel, VMT15	103 veh-mi
Peak-hour vehicle-miles of travel, VMT60	382 veh-mi
Peak 15-min total travel time, TT15	3.0 veh-h
Capacity from ATS, CdATS	1622 veh/h
Capacity from PTSF, CdPTSF	1673 veh/h
Directional Capacity	1622 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	34.2	mi/h
Percent time-spent-following, PTSFd (from above)	66.7	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 410.8
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 9.83
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
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Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 27 (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2018
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.91
Shoulder width	2.5 ft	% Trucks and buses	16 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	10 /mi

Analysis direction volume, Vd 483 veh/h
Opposing direction volume, Vo 334 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.2	1.3
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.969	0.954
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	548 pc/h	385 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 2.5 mi/h

Free-flow speed, FFSd	49.5	mi/h
Adjustment for no-passing zones, fnp	2.8	mi/h
Average travel speed, ATSD	39.5	mi/h
Percent Free Flow Speed, PFFS	79.7	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	0.984
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	531 pc/h	373 pc/h
Base percent time-spent-following,(note-4) BPTSFd	51.3	%
Adjustment for no-passing zones, fnp	39.3	
Percent time-spent-following, PTSFd	74.4	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.32
Peak 15-min vehicle-miles of travel, VMT15	133 veh-mi
Peak-hour vehicle-miles of travel, VMT60	483 veh-mi
Peak 15-min total travel time, TT15	3.4 veh-h
Capacity from ATS, CdATS	1622 veh/h
Capacity from PTSF, CdPTSF	1673 veh/h
Directional Capacity	1622 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	39.5	mi/h
Percent time-spent-following, PTSFd (from above)	74.4	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 530.8
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 9.83
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
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Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 453 (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2018
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	1.0 ft	% Trucks and buses	36 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	75 %
Up/down	- %	Access point density	4 /mi

Analysis direction volume, Vd 186 veh/h
Opposing direction volume, Vo 121 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.5	1.8
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.847	0.776
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	239 pc/h	169 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.7 mi/h
Adj. for access point density,(note-3) fA 1.0 mi/h

Free-flow speed, FFSd	39.3	mi/h
Adjustment for no-passing zones, fnp	3.1	mi/h
Average travel speed, ATSD	33.0	mi/h
Percent Free Flow Speed, PFFS	83.9	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.965	0.965
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	209 pc/h	136 pc/h
Base percent time-spent-following,(note-4) BPTSFd	22.4	%
Adjustment for no-passing zones, fnp	53.5	
Percent time-spent-following, PTSFd	54.8	%

Level of Service and Other Performance Measures

Level of service, LOS	B
Volume to capacity ratio, v/c	0.14
Peak 15-min vehicle-miles of travel, VMT15	51 veh-mi
Peak-hour vehicle-miles of travel, VMT60	186 veh-mi
Peak 15-min total travel time, TT15	1.5 veh-h
Capacity from ATS, CdATS	1319 veh/h
Capacity from PTSF, CdPTSF	1641 veh/h
Directional Capacity	1319 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	33.0	mi/h
Percent time-spent-following, PTSFd (from above)	54.8	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 202.2
Effective width of outside lane, We 12.50
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 24.24
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 453 (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2018
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.87
Shoulder width	1.0 ft	% Trucks and buses	36 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	70 %
Up/down	- %	Access point density	16 /mi

Analysis direction volume, Vd 181 veh/h
Opposing direction volume, Vo 152 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.5	1.6
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.847	0.822
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	246 pc/h	213 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 4.0 mi/h

Free-flow speed, FFSd	36.8	mi/h
Adjustment for no-passing zones, fnp	3.4	mi/h
Average travel speed, ATSD	29.9	mi/h
Percent Free Flow Speed, PFFS	81.2	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.965	0.965
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	216 pc/h	181 pc/h
Base percent time-spent-following,(note-4) BPTSFd	23.0	%
Adjustment for no-passing zones, fnp	58.9	
Percent time-spent-following, PTSFd	55.0	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.14
Peak 15-min vehicle-miles of travel, VMT15	52 veh-mi
Peak-hour vehicle-miles of travel, VMT60	181 veh-mi
Peak 15-min total travel time, TT15	1.7 veh-h
Capacity from ATS, CdATS	1397 veh/h
Capacity from PTSF, CdPTSF	1641 veh/h
Directional Capacity	1397 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	29.9	mi/h
Percent time-spent-following, PTSFd (from above)	55.0	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 208.0
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 24.20
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Jedburg Road (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2018
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.93
Shoulder width	2.5 ft	% Trucks and buses	11 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 523 veh/h
Opposing direction volume, Vo 327 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.3
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.989	0.968
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	569 pc/h	363 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	2.9	mi/h
Average travel speed, ATSD	33.3	mi/h
Percent Free Flow Speed, PFFS	76.6	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	0.989
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	562 pc/h	355 pc/h
Base percent time-spent-following,(note-4) BPTSFd	52.3	%
Adjustment for no-passing zones, fnp	37.7	
Percent time-spent-following, PTSFd	75.4	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.33
Peak 15-min vehicle-miles of travel, VMT15	141 veh-mi
Peak-hour vehicle-miles of travel, VMT60	523 veh-mi
Peak 15-min total travel time, TT15	4.2 veh-h
Capacity from ATS, CdATS	1646 veh/h
Capacity from PTSF, CdPTSF	1682 veh/h
Directional Capacity	1646 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	33.3	mi/h
Percent time-spent-following, PTSFd (from above)	75.4	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 562.4
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 7.47
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Jedburg Road (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2018
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.94
Shoulder width	2.5 ft	% Trucks and buses	11 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	60 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 497 veh/h
Opposing direction volume, Vo 723 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.2	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.978	0.989
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	541 pc/h	778 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	0.9	mi/h
Average travel speed, ATSD	32.4	mi/h
Percent Free Flow Speed, PFFS	74.5	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	529 pc/h	769 pc/h
Base percent time-spent-following,(note-4) BPTSFd	56.3	%
Adjustment for no-passing zones, fnp	27.8	
Percent time-spent-following, PTSFd	67.6	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.32
Peak 15-min vehicle-miles of travel, VMT15	132 veh-mi
Peak-hour vehicle-miles of travel, VMT60	497 veh-mi
Peak 15-min total travel time, TT15	4.1 veh-h
Capacity from ATS, CdATS	1681 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1681 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.4	mi/h
Percent time-spent-following, PTSFd (from above)	67.6	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 528.7
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 7.44
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Volvo Car Drive (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2018
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	6.0 ft	% Trucks and buses	10 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	20 %
Up/down	- %	Access point density	8 /mi

Analysis direction volume, Vd 0 veh/h
Opposing direction volume, Vo 0 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.9	1.9
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.917	0.917
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	0 pc/h	0 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 0.0 mi/h
Adj. for access point density,(note-3) fA 2.0 mi/h

Free-flow speed, FFSd	48.0	mi/h
Adjustment for no-passing zones, fnp	0.2	mi/h
Average travel speed, ATSD	47.8	mi/h
Percent Free Flow Speed, PFFS	99.7	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.990	0.990
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	0 pc/h	0 pc/h
Base percent time-spent-following,(note-4) BPTSFd	0.0	%
Adjustment for no-passing zones, fnp	29.2	
Percent time-spent-following, PTSFd		%

Level of Service and Other Performance Measures

Level of service, LOS	
Volume to capacity ratio, v/c	0.00
Peak 15-min vehicle-miles of travel, VMT15	0 veh-mi
Peak-hour vehicle-miles of travel, VMT60	0 veh-mi
Peak 15-min total travel time, TT15	0.0 veh-h
Capacity from ATS, CdATS	1559 veh/h
Capacity from PTSF, CdPTSF	1683 veh/h
Directional Capacity	1559 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	47.8	mi/h
Percent time-spent-following, PTSFd (from above)		
Level of service, LOSd (from above)		

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 0.0
Effective width of outside lane, We 42.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS -4.00
Bicycle LOS A

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 27 (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2018
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.93
Shoulder width	1.0 ft	% Trucks and buses	16 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	30 /mi

Analysis direction volume, Vd 348 veh/h
Opposing direction volume, Vo 382 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.3	1.3
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.954	0.954
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	392 pc/h	431 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 7.5 mi/h

Free-flow speed, FFSd	43.3	mi/h
Adjustment for no-passing zones, fnp	2.6	mi/h
Average travel speed, ATSD	34.4	mi/h
Percent Free Flow Speed, PFFS	79.3	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.984	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	380 pc/h	411 pc/h
Base percent time-spent-following,(note-4) BPTSFd	41.9	%
Adjustment for no-passing zones, fnp	45.9	
Percent time-spent-following, PTSFd	64.0	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.23
Peak 15-min vehicle-miles of travel, VMT15	94 veh-mi
Peak-hour vehicle-miles of travel, VMT60	348 veh-mi
Peak 15-min total travel time, TT15	2.7 veh-h
Capacity from ATS, CdATS	1622 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1622 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	34.4	mi/h
Percent time-spent-following, PTSFd (from above)	64.0	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 374.2
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 9.78
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 27 (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2018
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.91
Shoulder width	2.5 ft	% Trucks and buses	16 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	10 /mi

Analysis direction volume, Vd 334 veh/h
Opposing direction volume, Vo 483 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.3	1.2
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.954	0.969
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	385 pc/h	548 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 2.5 mi/h

Free-flow speed, FFSd	49.5	mi/h
Adjustment for no-passing zones, fnp	2.1	mi/h
Average travel speed, ATSD	40.2	mi/h
Percent Free Flow Speed, PFFS	81.1	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.984	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	373 pc/h	531 pc/h
Base percent time-spent-following,(note-4) BPTSFd	42.7	%
Adjustment for no-passing zones, fnp	39.3	
Percent time-spent-following, PTSFd	58.9	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.23
Peak 15-min vehicle-miles of travel, VMT15	92 veh-mi
Peak-hour vehicle-miles of travel, VMT60	334 veh-mi
Peak 15-min total travel time, TT15	2.3 veh-h
Capacity from ATS, CdATS	1647 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1647 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	40.2	mi/h
Percent time-spent-following, PTSFd (from above)	58.9	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 367.0
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 9.64
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 453 (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2018
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	1.0 ft	% Trucks and buses	36 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	75 %
Up/down	- %	Access point density	4 /mi

Analysis direction volume, Vd 121 veh/h
Opposing direction volume, Vo 186 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.8	1.5
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.776	0.847
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	169 pc/h	239 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.7 mi/h
Adj. for access point density,(note-3) fA 1.0 mi/h

Free-flow speed, FFSd	39.3	mi/h
Adjustment for no-passing zones, fnp	3.4	mi/h
Average travel speed, ATSD	32.8	mi/h
Percent Free Flow Speed, PFFS	83.3	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.965	0.965
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	136 pc/h	209 pc/h
Base percent time-spent-following,(note-4) BPTSFd	15.2	%
Adjustment for no-passing zones, fnp	53.5	
Percent time-spent-following, PTSFd	36.3	%

Level of Service and Other Performance Measures

Level of service, LOS	B
Volume to capacity ratio, v/c	0.10
Peak 15-min vehicle-miles of travel, VMT15	33 veh-mi
Peak-hour vehicle-miles of travel, VMT60	121 veh-mi
Peak 15-min total travel time, TT15	1.0 veh-h
Capacity from ATS, CdATS	1440 veh/h
Capacity from PTSF, CdPTSF	1641 veh/h
Directional Capacity	1440 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.8	mi/h
Percent time-spent-following, PTSFd (from above)	36.3	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 131.5
Effective width of outside lane, We 17.44
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 23.29
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 453 (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2018
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.87
Shoulder width	1.0 ft	% Trucks and buses	36 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	70 %
Up/down	- %	Access point density	16 /mi

Analysis direction volume, Vd 152 veh/h
Opposing direction volume, Vo 181 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.6	1.5
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.822	0.847
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	213 pc/h	246 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 4.0 mi/h

Free-flow speed, FFSd	36.8	mi/h
Adjustment for no-passing zones, fnp	3.2	mi/h
Average travel speed, ATSD	30.1	mi/h
Percent Free Flow Speed, PFFS	81.7	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.965	0.965
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	181 pc/h	216 pc/h
Base percent time-spent-following,(note-4) BPTSFd	20.6	%
Adjustment for no-passing zones, fnp	58.9	
Percent time-spent-following, PTSFd	47.5	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.13
Peak 15-min vehicle-miles of travel, VMT15	44 veh-mi
Peak-hour vehicle-miles of travel, VMT60	152 veh-mi
Peak 15-min total travel time, TT15	1.5 veh-h
Capacity from ATS, CdATS	1440 veh/h
Capacity from PTSF, CdPTSF	1641 veh/h
Directional Capacity	1440 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	30.1	mi/h
Percent time-spent-following, PTSFd (from above)	47.5	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 174.7
Effective width of outside lane, We 16.12
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 23.65
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1890	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	29	vph
Length of first accel/decel lane	465	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	155	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1890	29	155	vph
Peak-hour factor, PHF	0.92	0.81	0.83	

Peak 15-min volume, v_{15}	514	9	47	v
Trucks and buses	10	52	24	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.794	0.893	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2157	45	209	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 2157$ pc/h

$v_{12} = 2157$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	2157	4800	No
$v_{12} = v_F$			
$v_{12} = v_F - v_R$	2112	4800	No
$v_{12} = v_F - v_R$			
$v_{12} = v_F$	45	2000	No
$v_{12} = v_F$			
$v_{12} = v_F$ or $v_{12} = v_R$	0 pc/h	(Equation 13-14 or 13-17)	
$v_{12} = v_F$ or $v_{12} = v_R$			
Is $v_{12} = v_F$ or $v_{12} = v_R$ > 2700 pc/h?		No	
Is $v_{12} = v_F$ or $v_{12} = v_R$ > 1.5 $v_{12} / 2$		No	
If yes, $v_{12} = 2157$		(Equation 13-15, 13-16, 13-18, or 13-19)	
$v_{12} = 2157$			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2157	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 18.6$ pc/mi/ln

$D = 18.6$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.432$

S

Space mean speed in ramp influence area, $S = 57.9$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 57.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2016	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	124	vph
Length of first accel/decel lane	450	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	477	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2016	124	477	vph
Peak-hour factor, PHF	0.92	0.82	0.78	

Peak 15-min volume, v_{15}	548	38	153	v
Trucks and buses	10	8	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.962	0.966	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2301	157	633	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 2301$ pc/h

$v_{12} = 2301$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	2301	4800	No
$v_{12} = v_F$			
$v_{12} = v_F - v_R$	2144	4800	No
$v_{12} = v_F - v_R$			
$v_{12} = v_R$	157	2000	No
$v_{12} = v_R$			
$v_{12} = v_F$ or $v_{12} = v_R$	0 pc/h	(Equation 13-14 or 13-17)	
$v_{12} = v_F$ or $v_{12} = v_R$			
Is $v_{12} = v_F$ or $v_{12} = v_R$ > 2700 pc/h?		No	
Is $v_{12} = v_F$ or $v_{12} = v_R$ > 1.5 $v_{12} / 2$		No	
If yes, $v_{12} = 2301$		(Equation 13-15, 13-16, 13-18, or 13-19)	
$v_{12} = 2301$			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2301	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 20.0$ pc/mi/ln

$D = 20.0$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.442$

S

Space mean speed in ramp influence area, $S = 57.6$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 57.6 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2369	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	0	vph
Length of first accel/decel lane	1200	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	0	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	3500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent
		Ramp	
Volume, V (vph)	2369	0	0 vph
Peak-hour factor, PHF	0.92	0.92	0.92

Peak 15-min volume, v_{15}	644	0	0	v
Trucks and buses	10	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2704	0	0	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 2704$ pc/h

$v_{12} R F R FD$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	2704	4800	No
$v_{12} = v_F - v_R$	2704	4800	No
$v_{12} = v_F - v_R$	0	2000	No
$v_{12} = v_F$ or $v_{12} = v_R$	0 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} = v_F$ or $v_{12} = v_R$ > 2700 pc/h?		No	
Is $v_{12} = v_F$ or $v_{12} = v_R$ > 1.5 $v_{12} / 2$		No	
If yes, $v_{12} = 2704$		(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2704	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 16.7$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.428$

S

Space mean speed in ramp influence area, $S = 58.0$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 58.0 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2369	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	147	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	599	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1600	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2369	147	599	vph
Peak-hour factor, PHF	0.92	0.91	0.84	

Peak 15-min volume, v_{15}	644	40	178	v
Trucks and buses	10	19	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.913	0.966	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2704	177	738	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 2704$ pc/h

$v_{12} = 2704$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	2704	4800	No
$v_{12} = v_F$			
$v_{12} = v_F - v_R$	2527	4800	No
$v_{12} = v_F - v_R$			
$v_{12} = v_R$	177	2000	No
$v_{12} = v_R$			
$v_{12} = v_F$ or $v_{12} = v_R$	0 pc/h	(Equation 13-14 or 13-17)	
$v_{12} = v_F$ or $v_{12} = v_R$			
Is $v_{12} = v_F$ or $v_{12} = v_R$ > 2700 pc/h?		No	
Is $v_{12} = v_F$ or $v_{12} = v_R$ > 1.5 $v_{12} / 2$		No	
If yes, $v_{12} = 2704$		(Equation 13-15, 13-16, 13-18, or 13-19)	
$v_{12} = 2704$			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2704	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 23.0$ pc/mi/ln

$D = 23.0$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.444$

S

Space mean speed in ramp influence area, $S = 57.6$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 57.6 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3380	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	841	vph
Length of first accel/decel lane	465	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	144	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1600	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3380	841	144	vph
Peak-hour factor, PHF	0.93	0.98	0.86	

Peak 15-min volume, v_{15}	909	215	42	v
Trucks and buses	15	6	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.971	0.966	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3907	884	173	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 3907$ pc/h

$v_{12} = 3907$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	3907	4800	No
$v_{12} = v_F$			
$v_{12} = v_F - v_R$	3023	4800	No
$v_{12} = v_F - v_R$			
$v_{12} = v_F$	884	2000	No
$v_{12} = v_F$			
$v_{12} = v_F$	0 pc/h	(Equation 13-14 or 13-17)	
$v_{12} = v_F$			
Is $v_{12} = v_F > 2700$ pc/h?		No	
Is $v_{12} = v_F > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 3907$		(Equation 13-15, 13-16, 13-18, or 13-19)	
$v_{12} = 3907$			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3907	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 33.7$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable, $D = 0.508$

S

Space mean speed in ramp influence area, $S = 55.8$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 55.8 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2683	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	0	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane	1500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	0	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent
		Ramp	
Volume, V (vph)	2683	0	0 vph
Peak-hour factor, PHF	0.93	0.92	0.92

Peak 15-min volume, v_{15}	721	0	0	v
Trucks and buses	15	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3101	0	0	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 3101$ pc/h

$v_{12} R F R FD$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	3101	4800	No
$v_{12} = v_F - v_R$	3101	4800	No
$v_{12} = v_F - v_R$	0	4000	No
$v_{12} = v_F$ or $v_{12} = v_R$	0 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} = v_F$ or $v_{12} = v_R$ > 2700 pc/h?		No	
Is $v_{12} = v_F$ or $v_{12} = v_R$ > 1.5 $v_{12} / 2$		No	
If yes, $v_{12} = 3101$		(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3101	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = -9.6$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable, $D = 0.428$

S

Space mean speed in ramp influence area, $S = 58.0$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 58.0 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2683	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	467	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	143	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2683	467	143	vph
Peak-hour factor, PHF	0.93	0.91	0.74	

Peak 15-min volume, v_{15}	721	128	48	v
Trucks and buses	15	7	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.966	0.966	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3101	531	200	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 3101$ pc/h

$v_{12} = 3101$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	3101	4800	No
$v_{12} = v_F - v_R$	2570	4800	No
$v_{12} = v_F + v_R$	531	2000	No
$v_{12} = v_F$ or $v_{12} = v_F + v_R$	0 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} > 2700$ pc/h?		No	
Is $v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 3101$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3101	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 26.4$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.476$

S

Space mean speed in ramp influence area, $S = 56.7$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 56.7 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2359	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	158	vph
Length of first accel/decel lane	475	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	55	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2359	158	55	vph
Peak-hour factor, PHF	0.93	0.89	0.82	

Peak 15-min volume, v_{15}	634	44	17	v
Trucks and buses	15	21	24	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.905	0.893	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2727	196	75	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 2727$ pc/h

$v_{12} = 2727$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	2727	4800	No
$v_{12} = v_F - v_R$	2531	4800	No
$v_{12} = v_R$	196	2000	No
$v_{12} \text{ or } v_{12}$	0 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_{12} > 2700$ pc/h?		No	
Is $v_{12} \text{ or } v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 2727$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2727	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 23.4$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.446$

S

Space mean speed in ramp influence area, $S = 57.5$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 57.5 mph

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: West of SC 453
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1890	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	514	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1079	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.2	mi/h
Free-flow speed, FFS	72.2	mi/h

LOS and Performance Measures

Flow rate, vp	1079	pc/h/ln
Free-flow speed, FFS	72.2	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	2	
Density, D	15.4	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Between SC 453 Ramps
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1861	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	506	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1062	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.33	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.3	mi/h
Free-flow speed, FFS	74.1	mi/h

LOS and Performance Measures

Flow rate, vp	1062	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	2	
Density, D	14.2	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: SC 453 to SC 27
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2016	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	548	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1150	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	1150	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	74.8	mi/h
Number of lanes, N	2	
Density, D	15.4	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Between SC 27 Ramps
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1892	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	514	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1080	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.30	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.2	mi/h
Free-flow speed, FFS	74.2	mi/h

LOS and Performance Measures

Flow rate, vp	1080	pc/h/ln
Free-flow speed, FFS	74.2	mi/h
Average passenger-car speed, S	74.9	mi/h
Number of lanes, N	2	
Density, D	14.4	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Between SC 27 & Volvo
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2369	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	644	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1352	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	1352	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	73.6	mi/h
Number of lanes, N	2	
Density, D	18.4	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Between Volvo Ramps
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2369	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	644	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1352	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	1352	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	73.6	mi/h
Number of lanes, N	2	
Density, D	18.4	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Volvo to Jedburg
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2369	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	644	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1352	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	1352	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	73.6	mi/h
Number of lanes, N	2	
Density, D	18.4	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2222	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	604	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1268	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.50	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.8	mi/h
Free-flow speed, FFS	73.6	mi/h

LOS and Performance Measures

Flow rate, vp	1268	pc/h/ln
Free-flow speed, FFS	73.6	mi/h
Average passenger-car speed, S	74.2	mi/h
Number of lanes, N	2	
Density, D	17.1	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Jedsburg to Nexton
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2821	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	767	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1610	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.20	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.8	mi/h
Free-flow speed, FFS	71.6	mi/h

LOS and Performance Measures

Flow rate, vp	1610	pc/h/ln
Free-flow speed, FFS	71.6	mi/h
Average passenger-car speed, S	68.1	mi/h
Number of lanes, N	2	
Density, D	23.7	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Nexton to Jedburg
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3380	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	909	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1953	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.20	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.8	mi/h
Free-flow speed, FFS	71.6	mi/h

LOS and Performance Measures

Flow rate, vp	1953	pc/h/ln
Free-flow speed, FFS	71.6	mi/h
Average passenger-car speed, S	63.4	mi/h
Number of lanes, N	2	
Density, D	30.8	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2539	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	683	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1467	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.50	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.8	mi/h
Free-flow speed, FFS	73.6	mi/h

LOS and Performance Measures

Flow rate, vp	1467	pc/h/ln
Free-flow speed, FFS	73.6	mi/h
Average passenger-car speed, S	72.6	mi/h
Number of lanes, N	2	
Density, D	20.2	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Jedburg to Volvo
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2683	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	721	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1551	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	1551	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	71.6	mi/h
Number of lanes, N	2	
Density, D	21.7	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between Volvo Ramps
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2683	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	721	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1551	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	1551	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	71.6	mi/h
Number of lanes, N	2	
Density, D	21.7	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between Volvo & SC 27
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2683	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	721	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1551	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	1551	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	71.6	mi/h
Number of lanes, N	2	
Density, D	21.7	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between SC 27 Ramps
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2216	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	596	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1281	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.33	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.3	mi/h
Free-flow speed, FFS	74.1	mi/h

LOS and Performance Measures

Flow rate, vp	1281	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	74.1	mi/h
Number of lanes, N	2	
Density, D	17.3	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: SC 27 to SC 453
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2359	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	634	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1363	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	1363	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	73.5	mi/h
Number of lanes, N	2	
Density, D	18.5	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between SC 453 Ramps
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2201	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	592	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1272	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.33	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.3	mi/h
Free-flow speed, FFS	74.1	mi/h

LOS and Performance Measures

Flow rate, vp	1272	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	74.2	mi/h
Number of lanes, N	2	
Density, D	17.1	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: West of SC 453
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2256	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	606	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1304	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.2	mi/h
Free-flow speed, FFS	72.2	mi/h

LOS and Performance Measures

Flow rate, vp	1304	pc/h/ln
Free-flow speed, FFS	72.2	mi/h
Average passenger-car speed, S	69.9	mi/h
Number of lanes, N	2	
Density, D	18.7	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1861	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	155	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	29	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1861	155	29	vph
Peak-hour factor, PHF	0.92	0.83	0.81	

Peak 15-min volume, v_{15}	506	47	9	v
Trucks and buses	10	24	52	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.893	0.794	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2124	209	45	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)

EQ

$P = 1.000$ Using Equation 0

FM

$v_{12} = v_{12} (P) = 2124$ pc/h

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	2333	4800	No
FO			
v_{12} or v_{12}	0 pc/h	(Equation 13-14 or 13-17)	
3 av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
3 av34			
Is v_{12} or v_{12}	> 1.5 $v_{12} / 2$	No	
3 av34	12		
If yes, v_{12}	= 2124	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2333	4600	No
R12			

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 18.6$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.305$

S

Space mean speed in ramp influence area, $S = 61.5$ mph

R

Space mean speed in outer lanes, $S = N/A$ mph

0

Space mean speed for all vehicles, $S = 61.5$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1892	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	477	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	124	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1892	477	124	vph
Peak-hour factor, PHF	0.92	0.78	0.82	

Peak 15-min volume, v ₁₅	514	153	38	v
Trucks and buses	10	7	8	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.952	0.966	0.962	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	2159	633	157	pcph

Estimation of V₁₂ Merge Areas

L = (Equation 13-6 or 13-7)

EQ

P = 1.000 Using Equation 0

FM

v = v₁₂ (P) = 2159 pc/h

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v	2792	4800	No
FO			
v or v ₃	0 pc/h	(Equation 13-14 or 13-17)	
av ₃₄			
Is v or v ₃	> 2700 pc/h?	No	
av ₃₄			
Is v or v ₃	> 1.5 v ₁₂ / 2	No	
av ₃₄			
If yes, v _{12A}	= 2159	(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v	2792	4600	No
R ₁₂			

Level of Service Determination (if not F)

Density, D = $5.475 + 0.00734 v_R + 0.0078 v_A - 0.00627 L$ = 21.9 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, M = 0.329

S

Space mean speed in ramp influence area, S = 60.8 mph

R

Space mean speed in outer lanes, S = N/A mph

0

Space mean speed for all vehicles, S = 60.8 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2369	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-flow speed on ramp	35.0	mph
Volume on ramp	0	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane	1500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	0	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	3500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent
		Ramp	
Volume, V (vph)	2369	0	0 vph
Peak-hour factor, PHF	0.92	0.92	0.92

Peak 15-min volume, v_{15}	644	0	0	v
Trucks and buses	10	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2704	0	0	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)

EQ

$P = 1.000$ Using Equation 0

FM

$v_{12} = v_{12} (P) = 2704$ pc/h

FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	2704	4800	No
FO			
v_{12} or v_{12}	0 pc/h	(Equation 13-14 or 13-17)	
$\frac{v_{12}}{3}$ or $\frac{v_{12}}{3}$			
Is $\frac{v_{12}}{3}$ or $\frac{v_{12}}{3} > 2700$ pc/h?		No	
Is $\frac{v_{12}}{3}$ or $\frac{v_{12}}{3} > 1.5 \frac{v_{12}}{12}$		No	
If yes, $v_{12} = 2704$		(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2704	4600	No
R12			

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 \frac{v_{12}}{R} + 0.0078 \frac{v_{12}}{A} - 0.00627 L = -1.6$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable, $M = 0.064$

S

Space mean speed in ramp influence area, $S = 68.2$ mph

R

Space mean speed in outer lanes, $S = N/A$ mph

0

Space mean speed for all vehicles, $S = 68.2$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2222	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	599	vph
Length of first accel/decel lane	1120	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	147	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1600	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2222	599	147	vph
Peak-hour factor, PHF	0.92	0.84	0.91	

Peak 15-min volume, v_{15}	604	178	40	v
Trucks and buses	10	7	19	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.966	0.913	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2536	738	177	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)

EQ

$P = 1.000$ Using Equation 0

FM

$v_{12} = v_p (P) = 2536$ pc/h

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	3274	4800	No
FO			
v_{12} or v_{12}	0 pc/h	(Equation 13-14 or 13-17)	
3 av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
3 av34			
Is v_{12} or v_{12}	> 1.5 $v_{12} / 2$	No	
3 av34	12		
If yes, v_{12}	= 2536	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3274	4600	No
R12			

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 23.7$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $M = 0.346$

S

Space mean speed in ramp influence area, $S = 60.3$ mph

R

Space mean speed in outer lanes, $S = N/A$ mph

0

Space mean speed for all vehicles, $S = 60.3$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2539	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	144	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	841	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1600	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2539	144	841	vph
Peak-hour factor, PHF	0.93	0.86	0.98	

Peak 15-min volume, v ₁₅	683	42	215	v
Trucks and buses	15	7	6	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.930	0.966	0.971	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	2935	173	884	pcph

Estimation of V₁₂ Merge Areas

L = (Equation 13-6 or 13-7)

EQ

P = 1.000 Using Equation 0

FM

v = v₁₂ (P) = 2935 pc/h

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v	3108	4800	No
FO			
v or v ₃	0 pc/h	(Equation 13-14 or 13-17)	
av ₃₄			
Is v or v ₃	> 2700 pc/h?	No	
av ₃₄			
Is v or v ₃	> 1.5 v ₁₂ / 2	No	
av ₃₄	12		
If yes, v _{12A}	= 2935	(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v	3108	4600	No
R ₁₂			

Level of Service Determination (if not F)

Density, D = $5.475 + 0.00734 v_R + 0.0078 v_A - 0.00627 L$ = 24.6 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, M = 0.352

S

Space mean speed in ramp influence area, S = 60.1 mph

R

Space mean speed in outer lanes, S = N/A mph

0

Space mean speed for all vehicles, S = 60.1 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2683	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	0	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	0	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent
		Ramp	
Volume, V (vph)	2683	0	0 vph
Peak-hour factor, PHF	0.93	0.92	0.92

Peak 15-min volume, v_{15}	721	0	0	v
Trucks and buses	15	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3101	0	0	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)

EQ

$P = 1.000$ Using Equation 0

FM

$v_{12} = v_{12} (P) = 3101$ pc/h

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	3101	4800	No
FO			
v_{12} or v_{12}	0 pc/h	(Equation 13-14 or 13-17)	
$\frac{v_{12}}{3}$ av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
$\frac{v_{12}}{3}$ av34			
Is v_{12} or v_{12}	$> 1.5 \frac{v_{12}}{12}$	No	
$\frac{v_{12}}{3}$ av34			
If yes, $v_{12} = 3101$	(Equation 13-15, 13-16, 13-18, or 13-19)		
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3101	4600	No
R12			

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 \frac{v_{12}}{R} + 0.0078 \frac{v_{12}}{A} - 0.00627 L = 20.3$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $M = 0.303$

S

Space mean speed in ramp influence area, $S = 61.5$ mph

R

Space mean speed in outer lanes, $S = N/A$ mph

0

Space mean speed for all vehicles, $S = 61.5$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2216	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	143	vph
Length of first accel/decel lane	900	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	467	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2216	143	467	vph
Peak-hour factor, PHF	0.93	0.74	0.91	

Peak 15-min volume, v_{15}	596	48	128	v
Trucks and buses	15	7	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.966	0.966	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2562	200	531	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)

EQ

$P = 1.000$ Using Equation 0

FM

$v_{12} = v_{15} (P_{FM}) = 2562 \text{ pc/h}$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	2762	4800	No
FO			
v_{12} or v_{15}	0 pc/h	(Equation 13-14 or 13-17)	
$\frac{v_{12}}{3}$ or $\frac{v_{15}}{3}$			
Is $\frac{v_{12}}{3}$ or $\frac{v_{15}}{3} > 2700 \text{ pc/h}$?		No	
Is $\frac{v_{12}}{3}$ or $\frac{v_{15}}{3} > 1.5 \frac{v_{12}}{12}$		No	
If yes, $v_{12} = 2562$		(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2762	4600	No
R12			

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 \frac{v_{12}}{R} + 0.0078 \frac{v_{15}}{R} - 0.00627 L_A = 21.3 \text{ pc/mi/ln}$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $M = 0.320$

S

Space mean speed in ramp influence area, $S_R = 61.0 \text{ mph}$

R

Space mean speed in outer lanes, $S_0 = \text{N/A} \text{ mph}$

0

Space mean speed for all vehicles, $S = 61.0 \text{ mph}$

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2018
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2256	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	55	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	158	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2256	55	158	vph
Peak-hour factor, PHF	0.93	0.82	0.89	

Peak 15-min volume, v_{15}	606	17	44	v
Trucks and buses	15	24	21	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.893	0.905	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2608	75	196	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)

EQ

$P = 1.000$ Using Equation 0

FM

$v_{12} = v_{12} (P) = 2608$ pc/h

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	2683	4800	No
FO			
v_{12} or v_{12}	0 pc/h	(Equation 13-14 or 13-17)	
3 av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
3 av34			
Is v_{12} or v_{12}	> 1.5 $v_{12} / 2$	No	
3 av34	12		
If yes, v_{12}	= 2608	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2683	4600	No
R12			

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 21.4$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $M = 0.322$

S

Space mean speed in ramp influence area, $S = 61.0$ mph

R

Space mean speed in outer lanes, $S = N/A$ mph

0

Space mean speed for all vehicles, $S = 61.0$ mph

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Jedburg Road (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2018
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.95
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 522 veh/h
Opposing direction volume, Vo 379 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.2	1.3
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.986	0.979
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	557 pc/h	408 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	2.7	mi/h
Average travel speed, ATSD	33.3	mi/h
Percent Free Flow Speed, PFFS	76.7	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	0.993
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	549 pc/h	402 pc/h
Base percent time-spent-following,(note-4) BPTSFd	52.2	%
Adjustment for no-passing zones, fnp	38.7	
Percent time-spent-following, PTSFd	74.5	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.33
Peak 15-min vehicle-miles of travel, VMT15	137 veh-mi
Peak-hour vehicle-miles of travel, VMT60	522 veh-mi
Peak 15-min total travel time, TT15	4.1 veh-h
Capacity from ATS, CdATS	1664 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1664 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	33.3	mi/h
Percent time-spent-following, PTSFd (from above)	74.5	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 549.5
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.92
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Jedburg Road (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2018
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	60 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 638 veh/h
Opposing direction volume, Vo 777 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.993	0.993
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	698 pc/h	851 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	0.7	mi/h
Average travel speed, ATSD	30.7	mi/h
Percent Free Flow Speed, PFFS	70.6	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	693 pc/h	845 pc/h
Base percent time-spent-following,(note-4) BPTSFd	65.4	%
Adjustment for no-passing zones, fnp	23.7	
Percent time-spent-following, PTSFd	76.1	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.41
Peak 15-min vehicle-miles of travel, VMT15	173 veh-mi
Peak-hour vehicle-miles of travel, VMT60	638 veh-mi
Peak 15-min total travel time, TT15	5.6 veh-h
Capacity from ATS, CdATS	1688 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1688 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	30.7	mi/h
Percent time-spent-following, PTSFd (from above)	76.1	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 693.5
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 6.03
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Volvo Car Drive (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2018
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	6.0 ft	% Trucks and buses	10 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	20 %
Up/down	- %	Access point density	8 /mi

Analysis direction volume, Vd 0 veh/h
Opposing direction volume, Vo 0 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.9	1.9
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.917	0.917
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	0 pc/h	0 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 0.0 mi/h
Adj. for access point density,(note-3) fA 2.0 mi/h

Free-flow speed, FFSd	48.0	mi/h
Adjustment for no-passing zones, fnp	0.2	mi/h
Average travel speed, ATSD	47.8	mi/h
Percent Free Flow Speed, PFFS	99.7	%

Percent Time-Spent-Following

Direction	Analysis(d)	Oposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.990	0.990
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	0 pc/h	0 pc/h
Base percent time-spent-following,(note-4) BPTSFd	0.0	%
Adjustment for no-passing zones, fnp	29.2	
Percent time-spent-following, PTSFd		%

Level of Service and Other Performance Measures

Level of service, LOS	
Volume to capacity ratio, v/c	0.00
Peak 15-min vehicle-miles of travel, VMT15	0 veh-mi
Peak-hour vehicle-miles of travel, VMT60	0 veh-mi
Peak 15-min total travel time, TT15	0.0 veh-h
Capacity from ATS, CdATS	1559 veh/h
Capacity from PTSF, CdPTSF	1683 veh/h
Directional Capacity	1559 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	47.8	mi/h
Percent time-spent-following, PTSFd (from above)		
Level of service, LOSd (from above)		

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 0.0
Effective width of outside lane, We 42.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS -4.00
Bicycle LOS A

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 27 (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2018
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.79
Shoulder width	1.0 ft	% Trucks and buses	7 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	30 /mi

Analysis direction volume, Vd 416 veh/h
Opposing direction volume, Vo 535 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.2	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.986	0.993
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	534 pc/h	682 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 7.5 mi/h

Free-flow speed, FFSd	43.3	mi/h
Adjustment for no-passing zones, fnp	1.6	mi/h
Average travel speed, ATSD	32.3	mi/h
Percent Free Flow Speed, PFFS	74.6	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	527 pc/h	677 pc/h
Base percent time-spent-following,(note-4) BPTSFd	55.6	%
Adjustment for no-passing zones, fnp	32.8	
Percent time-spent-following, PTSFd	70.0	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.31
Peak 15-min vehicle-miles of travel, VMT15	132 veh-mi
Peak-hour vehicle-miles of travel, VMT60	416 veh-mi
Peak 15-min total travel time, TT15	4.1 veh-h
Capacity from ATS, CdATS	1688 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1688 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.3	mi/h
Percent time-spent-following, PTSFd (from above)	70.0	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 526.6
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 6.03
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 27 (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2018
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.83
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	10 /mi

Analysis direction volume, Vd 380 veh/h
Opposing direction volume, Vo 464 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.2	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.986	0.993
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	464 pc/h	563 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 2.5 mi/h

Free-flow speed, FFSd	49.5	mi/h
Adjustment for no-passing zones, fnp	2.0	mi/h
Average travel speed, ATSD	39.5	mi/h
Percent Free Flow Speed, PFFS	79.8	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	458 pc/h	559 pc/h
Base percent time-spent-following,(note-4) BPTSFd	49.6	%
Adjustment for no-passing zones, fnp	38.2	
Percent time-spent-following, PTSFd	66.8	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.27
Peak 15-min vehicle-miles of travel, VMT15	114 veh-mi
Peak-hour vehicle-miles of travel, VMT60	380 veh-mi
Peak 15-min total travel time, TT15	2.9 veh-h
Capacity from ATS, CdATS	1688 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1688 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	39.5	mi/h
Percent time-spent-following, PTSFd (from above)	66.8	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 457.8
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.82
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 453 (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2018
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.88
Shoulder width	1.0 ft	% Trucks and buses	24 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	75 %
Up/down	- %	Access point density	4 /mi

Analysis direction volume, Vd 148 veh/h
Opposing direction volume, Vo 171 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.6	1.5
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.874	0.893
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	192 pc/h	218 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.7 mi/h
Adj. for access point density,(note-3) fA 1.0 mi/h

Free-flow speed, FFSd	39.3	mi/h
Adjustment for no-passing zones, fnp	3.5	mi/h
Average travel speed, ATSD	32.6	mi/h
Percent Free Flow Speed, PFFS	83.0	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.977	0.977
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	172 pc/h	199 pc/h
Base percent time-spent-following,(note-4) BPTSFd	18.9	%
Adjustment for no-passing zones, fnp	58.8	
Percent time-spent-following, PTSFd	46.2	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.11
Peak 15-min vehicle-miles of travel, VMT15	42 veh-mi
Peak-hour vehicle-miles of travel, VMT60	148 veh-mi
Peak 15-min total travel time, TT15	1.3 veh-h
Capacity from ATS, CdATS	1518 veh/h
Capacity from PTSF, CdPTSF	1660 veh/h
Directional Capacity	1518 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.6	mi/h
Percent time-spent-following, PTSFd (from above)	46.2	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 168.2
Effective width of outside lane, We 15.75
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 13.88
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 453 (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2018
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.88
Shoulder width	1.0 ft	% Trucks and buses	24 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	70 %
Up/down	- %	Access point density	16 /mi

Analysis direction volume, Vd 162 veh/h
Opposing direction volume, Vo 230 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.6	1.4
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.874	0.912
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	211 pc/h	287 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 4.0 mi/h

Free-flow speed, FFSd	36.8	mi/h
Adjustment for no-passing zones, fnp	2.9	mi/h
Average travel speed, ATSD	30.0	mi/h
Percent Free Flow Speed, PFFS	81.5	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.977	0.977
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	189 pc/h	268 pc/h
Base percent time-spent-following,(note-4) BPTSFd	22.5	%
Adjustment for no-passing zones, fnp	54.5	
Percent time-spent-following, PTSFd	45.0	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.12
Peak 15-min vehicle-miles of travel, VMT15	46 veh-mi
Peak-hour vehicle-miles of travel, VMT60	162 veh-mi
Peak 15-min total travel time, TT15	1.5 veh-h
Capacity from ATS, CdATS	1550 veh/h
Capacity from PTSF, CdPTSF	1660 veh/h
Directional Capacity	1550 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	30.0	mi/h
Percent time-spent-following, PTSFd (from above)	45.0	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 184.1
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 14.32
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Jedburg Road (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2018
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.95
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 379 veh/h
Opposing direction volume, Vo 522 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.3	1.2
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.979	0.986
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	408 pc/h	557 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	2.0	mi/h
Average travel speed, ATSD	34.0	mi/h
Percent Free Flow Speed, PFFS	78.2	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.993	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	402 pc/h	549 pc/h
Base percent time-spent-following,(note-4) BPTSFd	45.2	%
Adjustment for no-passing zones, fnp	38.7	
Percent time-spent-following, PTSFd	61.6	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.24
Peak 15-min vehicle-miles of travel, VMT15	100 veh-mi
Peak-hour vehicle-miles of travel, VMT60	379 veh-mi
Peak 15-min total travel time, TT15	2.9 veh-h
Capacity from ATS, CdATS	1676 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1676 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	34.0	mi/h
Percent time-spent-following, PTSFd (from above)	61.6	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 398.9
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.75
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Jedburg Road (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2018
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	60 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 777 veh/h
Opposing direction volume, Vo 638 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.993	0.993
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	851 pc/h	698 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	1.1	mi/h
Average travel speed, ATSD	30.4	mi/h
Percent Free Flow Speed, PFFS	69.9	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	845 pc/h	693 pc/h
Base percent time-spent-following,(note-4) BPTSFd	70.6	%
Adjustment for no-passing zones, fnp	23.7	
Percent time-spent-following, PTSFd	83.6	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.50
Peak 15-min vehicle-miles of travel, VMT15	211 veh-mi
Peak-hour vehicle-miles of travel, VMT60	777 veh-mi
Peak 15-min total travel time, TT15	6.9 veh-h
Capacity from ATS, CdATS	1688 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1688 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	30.4	mi/h
Percent time-spent-following, PTSFd (from above)	83.6	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 844.6
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 6.13
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Volvo Car Drive (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2018
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	6.0 ft	% Trucks and buses	10 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	20 %
Up/down	- %	Access point density	8 /mi

Analysis direction volume, Vd 0 veh/h
Opposing direction volume, Vo 0 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.9	1.9
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.917	0.917
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	0 pc/h	0 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 0.0 mi/h
Adj. for access point density,(note-3) fA 2.0 mi/h

Free-flow speed, FFSd	48.0	mi/h
Adjustment for no-passing zones, fnp	0.2	mi/h
Average travel speed, ATSD	47.8	mi/h
Percent Free Flow Speed, PFFS	99.7	%

Percent Time-Spent-Following

Direction	Analysis(d)	Oposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.990	0.990
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	0 pc/h	0 pc/h
Base percent time-spent-following,(note-4) BPTSFd	0.0	%
Adjustment for no-passing zones, fnp	29.2	
Percent time-spent-following, PTSFd		%

Level of Service and Other Performance Measures

Level of service, LOS	
Volume to capacity ratio, v/c	0.00
Peak 15-min vehicle-miles of travel, VMT15	0 veh-mi
Peak-hour vehicle-miles of travel, VMT60	0 veh-mi
Peak 15-min total travel time, TT15	0.0 veh-h
Capacity from ATS, CdATS	1559 veh/h
Capacity from PTSF, CdPTSF	1683 veh/h
Directional Capacity	1559 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	47.8	mi/h
Percent time-spent-following, PTSFd (from above)		
Level of service, LOSd (from above)		

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 0.0
Effective width of outside lane, We 42.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS -4.00
Bicycle LOS A

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 27 (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2018
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.79
Shoulder width	1.0 ft	% Trucks and buses	7 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	30 /mi

Analysis direction volume, Vd 535 veh/h
Opposing direction volume, Vo 416 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.2
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.993	0.986
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	682 pc/h	534 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 7.5 mi/h

Free-flow speed, FFSd	43.3	mi/h
Adjustment for no-passing zones, fnp	2.1	mi/h
Average travel speed, ATSD	31.8	mi/h
Percent Free Flow Speed, PFFS	73.4	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	677 pc/h	527 pc/h
Base percent time-spent-following,(note-4) BPTSFd	61.4	%
Adjustment for no-passing zones, fnp	32.8	
Percent time-spent-following, PTSFd	79.8	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.40
Peak 15-min vehicle-miles of travel, VMT15	169 veh-mi
Peak-hour vehicle-miles of travel, VMT60	535 veh-mi
Peak 15-min total travel time, TT15	5.3 veh-h
Capacity from ATS, CdATS	1676 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1676 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	31.8	mi/h
Percent time-spent-following, PTSFd (from above)	79.8	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 677.2
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 6.16
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 27 (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2018
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.83
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	10 /mi

Analysis direction volume, Vd 464 veh/h
Opposing direction volume, Vo 380 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.2
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.993	0.986
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	563 pc/h	464 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 2.5 mi/h

Free-flow speed, FFSd	49.5	mi/h
Adjustment for no-passing zones, fnp	2.4	mi/h
Average travel speed, ATSD	39.1	mi/h
Percent Free Flow Speed, PFFS	79.0	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	559 pc/h	458 pc/h
Base percent time-spent-following,(note-4) BPTSFd	54.2	%
Adjustment for no-passing zones, fnp	38.2	
Percent time-spent-following, PTSFd	75.2	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.33
Peak 15-min vehicle-miles of travel, VMT15	140 veh-mi
Peak-hour vehicle-miles of travel, VMT60	464 veh-mi
Peak 15-min total travel time, TT15	3.6 veh-h
Capacity from ATS, CdATS	1676 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1676 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	39.1	mi/h
Percent time-spent-following, PTSFd (from above)	75.2	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 559.0
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.93
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 453 (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2018
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.88
Shoulder width	1.0 ft	% Trucks and buses	24 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	75 %
Up/down	- %	Access point density	4 /mi

Analysis direction volume, Vd 171 veh/h
Opposing direction volume, Vo 148 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.5	1.6
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.893	0.874
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	218 pc/h	192 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.7 mi/h
Adj. for access point density,(note-3) fA 1.0 mi/h

Free-flow speed, FFSd	39.3	mi/h
Adjustment for no-passing zones, fnp	3.5	mi/h
Average travel speed, ATSD	32.6	mi/h
Percent Free Flow Speed, PFFS	83.0	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.977	0.977
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	199 pc/h	172 pc/h
Base percent time-spent-following,(note-4) BPTSFd	21.5	%
Adjustment for no-passing zones, fnp	58.8	
Percent time-spent-following, PTSFd	53.0	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.13
Peak 15-min vehicle-miles of travel, VMT15	49 veh-mi
Peak-hour vehicle-miles of travel, VMT60	171 veh-mi
Peak 15-min total travel time, TT15	1.5 veh-h
Capacity from ATS, CdATS	1486 veh/h
Capacity from PTSF, CdPTSF	1660 veh/h
Directional Capacity	1486 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.6	mi/h
Percent time-spent-following, PTSFd (from above)	53.0	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 194.3
Effective width of outside lane, We 12.50
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 14.41
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 453 (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2018
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.88
Shoulder width	1.0 ft	% Trucks and buses	24 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	70 %
Up/down	- %	Access point density	16 /mi

Analysis direction volume, Vd 230 veh/h
Opposing direction volume, Vo 162 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.4	1.6
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.912	0.874
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	287 pc/h	211 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 4.0 mi/h

Free-flow speed, FFSd	36.8	mi/h
Adjustment for no-passing zones, fnp	3.4	mi/h
Average travel speed, ATSD	29.6	mi/h
Percent Free Flow Speed, PFFS	80.3	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.977	0.977
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	268 pc/h	189 pc/h
Base percent time-spent-following,(note-4) BPTSFd	27.6	%
Adjustment for no-passing zones, fnp	54.5	
Percent time-spent-following, PTSFd	59.6	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.17
Peak 15-min vehicle-miles of travel, VMT15	65 veh-mi
Peak-hour vehicle-miles of travel, VMT60	230 veh-mi
Peak 15-min total travel time, TT15	2.2 veh-h
Capacity from ATS, CdATS	1518 veh/h
Capacity from PTSF, CdPTSF	1660 veh/h
Directional Capacity	1518 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	29.6	mi/h
Percent time-spent-following, PTSFd (from above)	59.6	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 261.4
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 14.49
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

June 2019

C.2 2023 NO BUILD



HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1525	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	55	vph
Length of first accel/decel lane	465	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	142	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1525	55	142	vph
Peak-hour factor, PHF	0.91	0.95	0.90	

Peak 15-min volume, v_{15}	419	14	39	v
Trucks and buses	24	53	36	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.791	0.847	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	1877	73	186	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 1877$ pc/h

$v_{12} = 1877$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	1877	4800	No
$v_{12} = v_F$			
$v_{12} = v_F - v_R$	1804	4800	No
$v_{12} = v_F - v_R$			
$v_{12} = v_F$	73	2000	No
$v_{12} = v_F$			
$v_{12} = v_F$	0 pc/h	(Equation 13-14 or 13-17)	
$v_{12} = v_F$			
Is $v_{12} = v_F > 2700$ pc/h?		No	
$v_{12} = v_F$			
Is $v_{12} = v_F > 1.5 v_{12} / 2$		No	
$v_{12} = v_F$			
If yes, $v_{12} = 1877$		(Equation 13-15, 13-16, 13-18, or 13-19)	
$v_{12} = 1877$			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1877	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 16.2$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.435$

S

Space mean speed in ramp influence area, $S = 57.8$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 57.8 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1612	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	119	vph
Length of first accel/decel lane	450	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	507	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1612	119	507	vph
Peak-hour factor, PHF	0.91	0.90	0.90	

Peak 15-min volume, v_{15}	443	33	141	v
Trucks and buses	24	23	16	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.897	0.926	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1984	147	608	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 1984$ pc/h

$v_{12} = 1984$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	1984	4800	No
$v_{12} = v_F$			
$v_{12} = v_F - v_R$	1837	4800	No
$v_{12} = v_F - v_R$			
$v_{12} = v_R$	147	2000	No
$v_{12} = v_R$			
$v_{12} = v_F$ or $v_{12} = v_R$	0 pc/h	(Equation 13-14 or 13-17)	
$v_{12} = v_F$ or $v_{12} = v_R$			
Is $v_{12} = v_F$ or $v_{12} = v_R$ > 2700 pc/h?		No	
Is $v_{12} = v_F$ or $v_{12} = v_R$ > 1.5 $v_{12} / 2$		No	
If yes, $v_{12} = 1984$		(Equation 13-15, 13-16, 13-18, or 13-19)	
$v_{12} = 1984$			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1984	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 17.3$ pc/mi/ln

$D = 17.3$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.441$

S

Space mean speed in ramp influence area, $S = 57.6$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 57.6 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2000	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	98	vph
Length of first accel/decel lane	1200	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	89	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	3500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2000	98	89	vph
Peak-hour factor, PHF	0.91	0.92	0.92	

Peak 15-min volume, v_{15}	549	27	24	v
Trucks and buses	24	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2462	112	102	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 2462$ pc/h

$v_{12} = 2462$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	2462	4800	No
$v_{12} = v_F - v_R$	2350	4800	No
$v_{12} = v_F$	112	2000	No
$v_{12} \text{ or } v_R$	0 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_R > 2700$ pc/h?		No	
Is $v_{12} \text{ or } v_R > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 2462$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2462	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 14.6$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.438$

S

Space mean speed in ramp influence area, $S = 57.7$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 57.7 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1991	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	145	vph
Length of first accel/decel lane	180	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	864	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2900	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
	Ramp			
Volume, V (vph)	1991	145	864	vph
Peak-hour factor, PHF	0.91	0.90	0.90	

Peak 15-min volume, v_{15}	547	40	240	v
Trucks and buses	24	29	11	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.873	0.948	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2450	184	1013	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.690$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 1748$ pc/h

$v_{12} = 1748$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	2450	7200	No
$v_{12} = v_F + (v_R - v_F) P$	2266	7200	No
$v_{12} = v_R$	184	2000	No
$v_{12} = v_F$ or $v_{12} = v_R$	702 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} > 2700$ pc/h?		No	
Is $v_{12} > 1.5 v_F / 2$		No	
If yes, $v_{12} = 1748$	(Equation 13-15, 13-16, 13-18, or 13-19)		

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1748	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 17.7$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.445$

S

Space mean speed in ramp influence area, $S = 57.6$ mph

R

Space mean speed in outer lanes, S = 76.8 mph

0

Space mean speed for all vehicles, S = 62.0 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2750	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	316	vph
Length of first accel/decel lane	850	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	151	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	750	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2750	316	151	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v ₁₅	747	88	42	v
Trucks and buses	22	10	11	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.901	0.952	0.948	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	3318	369	177	pcph

Estimation of V₁₂ Diverge Areas

L = (Equation 13-12 or 13-13)

EQ

P = 0.660 Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 2316$ pc/h

12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	3318	7200	No
$v_{12} = v_R - v_F$	2949	7200	No
$v_{12} = v_R$	369	2000	No
v_{12} or v_{12}	1002 pc/h	(Equation 13-14 or 13-17)	
Is v_{12} or v_{12} > 2700 pc/h?		No	
Is v_{12} or v_{12} > 1.5 $v_{12} / 2$		No	
If yes, $v_{12} = 2316$	(Equation 13-15, 13-16, 13-18, or 13-19)		
12A			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2316	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 16.5$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.461$

S

Space mean speed in ramp influence area, $S = 57.1$ mph

R

Space mean speed in outer lanes, S = 76.8 mph

0

Space mean speed for all vehicles, S = 61.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2902	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	152	vph
Length of first accel/decel lane	150	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	316	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	920	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2902	152	316	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v_{15}	789	42	88	v
Trucks and buses	22	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3501	177	369	pcph

Estimation of V12 Diverge Areas

$$L = 379.52 \text{ (Equation 13-12 or 13-13)}$$

EQ

$$P = 0.664 \text{ Using Equation 5}$$

FD

$$v_{12} = v_F + (v_R - v_F) P = 2385 \text{ pc/h}$$

$$v_{12} = 2385 \text{ pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	3501	7200	No
$v_{12} = v_F$			
$v_{12} = v_F - v_R$	3324	7200	No
$v_{12} = v_F - v_R$			
$v_{12} = v_F$	177	2000	No
$v_{12} = v_F$			
$v_{12} = v_F$	1116 pc/h	(Equation 13-14 or 13-17)	
$v_{12} = v_F$			
Is $v_{12} = v_F > 2700 \text{ pc/h}$?		No	
$v_{12} = v_F$			
Is $v_{12} = v_F > 1.5 v_{12} / 2$?		No	
$v_{12} = v_F$			
If yes, $v_{12} = 2385$		(Equation 13-15, 13-16, 13-18, or 13-19)	
$v_{12} = 2385$			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2385	4400	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L = 23.4 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

$$\text{Intermediate speed variable, } D = 0.444$$

S

$$\text{Space mean speed in ramp influence area, } S = 57.6 \text{ mph}$$

R

Space mean speed in outer lanes, S = 76.3 mph

0

Space mean speed for all vehicles, S = 62.5 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2585	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	394	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane	1500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	23	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2585	394	23	vph
Peak-hour factor, PHF	0.92	0.92	0.92	

Peak 15-min volume, v_{15}	702	107	6	v
Trucks and buses	22	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3119	450	26	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_R + (v_F - v_R) P = 3119$ pc/h

$v_{12} = 3119$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_R$	3119	4800	No
$v_{12} = v_F$			
$v_{12} = v_F - v_R$	2669	4800	No
$v_{12} = v_F$			
$v_{12} = v_R$	450	4000	No
$v_{12} = v_F$			
$v_{12} = v_F$ or $v_{12} = v_R$	0 pc/h	(Equation 13-14 or 13-17)	
$v_{12} = v_F$ or $v_{12} = v_R$			
Is $v_{12} = v_F$ or $v_{12} = v_R$ > 2700 pc/h?		No	
Is $v_{12} = v_F$ or $v_{12} = v_R$ > 1.5 $v_{12} / 2$		No	
If yes, $v_{12} = 3119$		(Equation 13-15, 13-16, 13-18, or 13-19)	
$v_{12} = 3119$			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3119	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = -9.4$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable, $D = 0.469$

S

Space mean speed in ramp influence area, $S = 56.9$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 56.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2214	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	376	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	117	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2214	376	117	vph
Peak-hour factor, PHF	0.92	0.94	0.90	

Peak 15-min volume, v_{15}	602	100	33	v
Trucks and buses	22	25	16	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.889	0.926	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2671	450	140	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 2671$ pc/h

$v_{12} = 2671$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	2671	4800	No
$v_{12} = v_F - v_R$	2221	4800	No
$v_{12} = v_R$	450	2000	No
$v_{12} \text{ or } v_{12}$	0 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_{12} > 2700$ pc/h?		No	
Is $v_{12} \text{ or } v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 2671$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2671	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 22.7$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.469$

S

Space mean speed in ramp influence area, $S = 56.9$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 56.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1955	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	161	vph
Length of first accel/decel lane	475	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	54	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1955	161	54	vph
Peak-hour factor, PHF	0.92	0.90	0.92	

Peak 15-min volume, v_{15}	531	45	15	v
Trucks and buses	22	46	36	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.813	0.847	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2359	220	69	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 2359$ pc/h

$v_{12} = 2359$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	2359	4800	No
$v_{12} = v_F - v_R$	2139	4800	No
$v_{12} = v_R$	220	2000	No
$v_{12} \text{ or } v_{12}$	0 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_{12} > 2700$ pc/h?		No	
Is $v_{12} \text{ or } v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 2359$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2359	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 20.3$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.448$

S

Space mean speed in ramp influence area, $S = 57.5$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 57.5 mph

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: West of SC 453
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1525	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	419	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	938	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.2	mi/h
Free-flow speed, FFS	72.2	mi/h

LOS and Performance Measures

Flow rate, vp	938	pc/h/ln
Free-flow speed, FFS	72.2	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	2	
Density, D	13.4	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Between SC 453 Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1470	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	404	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	905	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.33	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.3	mi/h
Free-flow speed, FFS	74.1	mi/h

LOS and Performance Measures

Flow rate, vp	905	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	2	
Density, D	12.1	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: SC 453 to SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1612	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	443	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	992	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	992	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	2	
Density, D	13.2	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Between SC 27 Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1493	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	410	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	919	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	919	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	2	
Density, D	12.3	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Between SC 27 & Volvo
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2000	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	549	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	1231	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1231	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	74.4	mi/h
Number of lanes, N	2	
Density, D	16.5	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Between Volvo Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1902	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	523	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	1170	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1170	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	74.7	mi/h
Number of lanes, N	2	
Density, D	15.7	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Volvo to Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1991	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	547	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	1225	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1225	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	74.4	mi/h
Number of lanes, N	2	
Density, D	16.5	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1846	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	507	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	757	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.50	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.8	mi/h
Free-flow speed, FFS	73.6	mi/h

LOS and Performance Measures

Flow rate, vp	757	pc/h/ln
Free-flow speed, FFS	73.6	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	10.1	pc/mi/ln
Level of service, LOS	A	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Jedburg to Nexton
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2710	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	745	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	1112	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.20	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.8	mi/h
Free-flow speed, FFS	71.6	mi/h

LOS and Performance Measures

Flow rate, vp	1112	pc/h/ln
Free-flow speed, FFS	71.6	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	3	
Density, D	15.9	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Nexton to Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2902	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	789	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1167	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.33	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	4.1	mi/h
Free-flow speed, FFS	71.3	mi/h

LOS and Performance Measures

Flow rate, vp	1167	pc/h/ln
Free-flow speed, FFS	71.3	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	3	
Density, D	16.7	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2434	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	661	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	979	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	979	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	13.1	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2750	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	747	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1106	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1106	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	74.9	mi/h
Number of lanes, N	3	
Density, D	14.8	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Jeddburg to Volvo
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2585	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	702	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1559	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	1559	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	71.5	mi/h
Number of lanes, N	2	
Density, D	21.8	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between Volvo Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2191	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	595	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1322	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1322	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	73.9	mi/h
Number of lanes, N	2	
Density, D	17.9	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between Volvo & SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2214	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	602	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1336	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1336	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	73.8	mi/h
Number of lanes, N	2	
Density, D	18.1	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between SC 27 Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1838	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	499	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1109	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1109	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	74.9	mi/h
Number of lanes, N	2	
Density, D	14.8	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: SC 27 to SC 453
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1955	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	531	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1179	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	1179	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	74.6	mi/h
Number of lanes, N	2	
Density, D	15.8	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between SC 453 Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1794	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	487	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1082	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.33	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.3	mi/h
Free-flow speed, FFS	74.1	mi/h

LOS and Performance Measures

Flow rate, vp	1082	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	74.9	mi/h
Number of lanes, N	2	
Density, D	14.4	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: West of SC 453
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1898	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	516	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1145	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.2	mi/h
Free-flow speed, FFS	72.2	mi/h

LOS and Performance Measures

Flow rate, vp	1145	pc/h/ln
Free-flow speed, FFS	72.2	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	2	
Density, D	16.4	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1470	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	142	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	55	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1470	142	55	vph
Peak-hour factor, PHF	0.91	0.90	0.95	

Peak 15-min volume, v ₁₅	404	39	14	v
Trucks and buses	24	36	53	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.893	0.847	0.791	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	1809	186	73	pcph

Estimation of V₁₂ Merge Areas

L = (Equation 13-6 or 13-7)

EQ

P = 1.000 Using Equation 0

FM

v = v₁₂ (P) = 1809 pc/h

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v ₁₂	1995	4800	No
FO			
v ₃ or v _{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v ₃ or v _{av34} > 2700 pc/h?		No	
Is v ₃ or v _{av34} > 1.5 v ₁₂ / 2		No	
If yes, v _{12A} = 1809		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v ₁₂	1995	4600	No

Level of Service Determination (if not F)

Density, D = $5.475 + 0.00734 v_{12} + 0.0078 v_A - 0.00627 L$ = 15.9 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, M = 0.294

S

Space mean speed in ramp influence area, S = 61.8 mph

R

Space mean speed in outer lanes, S = N/A mph

0

Space mean speed for all vehicles, S = 61.8 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1493	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	507	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	119	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1493	507	119	vph
Peak-hour factor, PHF	0.91	0.90	0.90	

Peak 15-min volume, v_{15}	410	141	33	v
Trucks and buses	24	16	23	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.926	0.897	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	1838	608	147	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)

EQ

$P = 1.000$ Using Equation 0

FM

$v_{12} = v_{12} (P) = 1838$ pc/h

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	2446	4800	No
FO			
v_{12} or v_{12}	0 pc/h	(Equation 13-14 or 13-17)	
$\frac{v_{12}}{3}$ av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
$\frac{v_{12}}{3}$ av34			
Is v_{12} or v_{12}	$> 1.5 \frac{v_{12}}{12}$	No	
$\frac{v_{12}}{3}$ av34			
If yes, $v_{12} = 1838$	(Equation 13-15, 13-16, 13-18, or 13-19)		
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2446	4600	No
R12			

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 \frac{v_{12}}{R} + 0.0078 \frac{v_{12}}{A} - 0.00627 L = 19.3$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.310$

S

Space mean speed in ramp influence area, $S = 61.3$ mph

R

Space mean speed in outer lanes, $S = N/A$ mph

0

Space mean speed for all vehicles, $S = 61.3$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1902	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-flow speed on ramp	35.0	mph
Volume on ramp	89	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane	1500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	98	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	3500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1902	89	98	vph
Peak-hour factor, PHF	0.91	0.92	0.92	

Peak 15-min volume, v_{15}	523	24	27	v
Trucks and buses	24	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2341	102	112	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)

EQ

$P = 1.000$ Using Equation 0

FM

$v_{12} = v_{15} (P_{FM}) = 2341$ pc/h

12 F FM

Capacity Checks

v_{12}	Actual 2443	Maximum 4800	LOS F? No
FO			
v_{12} or v_{15}	0 pc/h	(Equation 13-14 or 13-17)	
$\frac{v_{12}}{3}$ or $\frac{v_{15}}{3}$			
Is v_{12} or $v_{15} > 2700$ pc/h?		No	
$\frac{v_{12}}{3}$ or $\frac{v_{15}}{3}$			
Is v_{12} or $v_{15} > 1.5 \frac{v_{12}}{12}$		No	
$\frac{v_{12}}{3}$ or $\frac{v_{15}}{3}$			
If yes, $v_{12} = 2341$	(Equation 13-15, 13-16, 13-18, or 13-19)		
12A			

Flow Entering Merge Influence Area

v_{12}	Actual 2443	Max Desirable 4600	Violation? No
R12			

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 \frac{v_{12}}{R} + 0.0078 \frac{v_{15}}{A} - 0.00627 L = -3.7$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable, $M = 0.051$

S

Space mean speed in ramp influence area, $S_R = 68.6$ mph

R

Space mean speed in outer lanes, $S_0 = N/A$ mph

0

Space mean speed for all vehicles, $S = 68.6$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1846	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	864	vph
Length of first accel/decel lane	1120	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	145	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2900	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1846	864	145	vph
Peak-hour factor, PHF	0.91	0.90	0.90	

Peak 15-min volume, v_{15}	507	240	40	v
Trucks and buses	24	11	29	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.948	0.873	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2272	1013	184	pcph

Estimation of V12 Merge Areas

$$L = 628.47 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.609 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 1383 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	3285	7200	No
FO			
v_{12} or v_{12}	889 pc/h	(Equation 13-14 or 13-17)	
3 av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
3 av34			
Is v_{12} or v_{12}	> 1.5 $v_{12} / 2$	Yes	
3 av34	12		
If yes, v_{12}	= 1383	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2396	4600	No
12A			

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 16.7 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.285$

S

Space mean speed in ramp influence area, $S = 62.0$ mph

R

Space mean speed in outer lanes, $S = 68.6$ mph

0

Space mean speed for all vehicles, $S = 63.7$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2434	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	151	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	316	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	750	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2434	151	316	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v ₁₅	661	42	88	v
Trucks and buses	22	11	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.901	0.948	0.952	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	2937	177	369	pcph

Estimation of V₁₂ Merge Areas

$$L = 760.60 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.619 \text{ Using Equation 2}$$

FM

$$v_{12} = v_{12} (P) = 1817 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v	3114	7200	No
FO			
v or v ₃	1120 pc/h	(Equation 13-14 or 13-17)	
av ₃₄			
Is v or v ₃	> 2700 pc/h?	No	
av ₃₄			
Is v or v ₃	> 1.5 v ₁₂ / 2	Yes	
av ₃₄	12		
If yes, v _{12A}	= 1817	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v	1994	4600	No
12A			

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_R + 0.0078 v_A - 0.00627 L = 11.5 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

$$\text{Intermediate speed variable, } M = 0.245$$

S

$$\text{Space mean speed in ramp influence area, } S_R = 63.1 \text{ mph}$$

R

$$\text{Space mean speed in outer lanes, } S_0 = 67.8 \text{ mph}$$

0

$$\text{Space mean speed for all vehicles, } S = 64.7 \text{ mph}$$

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2191	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	23	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	394	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2191	23	394	vph
Peak-hour factor, PHF	0.92	0.92	0.92	

Peak 15-min volume, v ₁₅	595	6	107	v
Trucks and buses	22	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.901	0.952	0.952	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	2643	26	450	pcph

Estimation of V₁₂ Merge Areas

L = (Equation 13-6 or 13-7)

EQ

P = 1.000 Using Equation 0

FM

v = v₁₂ (P) = 2643 pc/h

FM

Capacity Checks

	Actual	Maximum	LOS F?
v	2669	4800	No
FO			
v or v ₃	0 pc/h	(Equation 13-14 or 13-17)	
av ₃₄			
Is v or v ₃	> 2700 pc/h?	No	
av ₃₄			
Is v or v ₃	> 1.5 v ₁₂ / 2	No	
av ₃₄			
If yes, v _{12A}	= 2643	(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v	2669	4600	No
R ₁₂			

Level of Service Determination (if not F)

Density, D = $5.475 + 0.00734 v_R + 0.0078 v_A - 0.00627 L$ = 16.9 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, M = 0.272

S

Space mean speed in ramp influence area, S = 62.4 mph

R

Space mean speed in outer lanes, S = N/A mph

0

Space mean speed for all vehicles, S = 62.4 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1838	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	117	vph
Length of first accel/decel lane	900	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	376	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1838	117	376	vph
Peak-hour factor, PHF	0.92	0.90	0.94	

Peak 15-min volume, v_{15}	499	33	100	v
Trucks and buses	22	16	25	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.926	0.889	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2218	140	450	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)

EQ

$P = 1.000$ Using Equation 0

FM

$v_{12} = v_{12} (P) = 2218$ pc/h

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	2358	4800	No
FO			
v_{12} or v_{12}	0 pc/h	(Equation 13-14 or 13-17)	
$\frac{v_{12}}{3}$ av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
$\frac{v_{12}}{3}$ av34			
Is v_{12} or v_{12}	$> 1.5 \frac{v_{12}}{12}$	No	
$\frac{v_{12}}{3}$ av34			
If yes, $v_{12} = 2218$	(Equation 13-15, 13-16, 13-18, or 13-19)		
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2358	4600	No
R12			

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 \frac{v_{12}}{R} + 0.0078 \frac{v_{12}}{A} - 0.00627 L = 18.2$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.299$

S

Space mean speed in ramp influence area, $S = 61.6$ mph

R

Space mean speed in outer lanes, $S = N/A$ mph

0

Space mean speed for all vehicles, $S = 61.6$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1794	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	54	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	161	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1794	54	161	vph
Peak-hour factor, PHF	0.92	0.92	0.90	

Peak 15-min volume, v ₁₅	487	15	45	v
Trucks and buses	22	36	46	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.901	0.847	0.813	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	2164	69	220	pcph

Estimation of V12 Merge Areas

L = (Equation 13-6 or 13-7)

EQ

P = 1.000 Using Equation 0

FM

v = v₁₂ (P) = 2164 pc/h

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v	2233	4800	No
FO			
v or v ₃	0 pc/h	(Equation 13-14 or 13-17)	
av ₃₄			
Is v or v ₃	> 2700 pc/h?	No	
av ₃₄			
Is v or v ₃	> 1.5 v ₁₂ / 2	No	
av ₃₄	12		
If yes, v _{12A}	= 2164	(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v	2233	4600	No
R12			

Level of Service Determination (if not F)

Density, D = $5.475 + 0.00734 v_R + 0.0078 v_A - 0.00627 L$ = 17.8 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, M = 0.301

S

Space mean speed in ramp influence area, S = 61.6 mph

R

Space mean speed in outer lanes, S = N/A mph

0

Space mean speed for all vehicles, S = 61.6 mph

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Jedburg Road (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.93
Shoulder width	2.5 ft	% Trucks and buses	11 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 352 veh/h
Opposing direction volume, Vo 562 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.3	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.968	0.989
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	391 pc/h	611 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	1.8	mi/h
Average travel speed, ATSD	34.0	mi/h
Percent Free Flow Speed, PFFS	78.1	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.989	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	383 pc/h	604 pc/h
Base percent time-spent-following,(note-4) BPTSFd	44.0	%
Adjustment for no-passing zones, fnp	36.1	
Percent time-spent-following, PTSFd	58.0	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.23
Peak 15-min vehicle-miles of travel, VMT15	95 veh-mi
Peak-hour vehicle-miles of travel, VMT60	352 veh-mi
Peak 15-min total travel time, TT15	2.8 veh-h
Capacity from ATS, CdATS	1681 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1681 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	34.0	mi/h
Percent time-spent-following, PTSFd (from above)	58.0	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 378.5
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 7.27
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Jedburg Road (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.94
Shoulder width	2.5 ft	% Trucks and buses	11 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	60 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 777 veh/h
Opposing direction volume, Vo 535 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.989	0.989
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	836 pc/h	575 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	1.4	mi/h
Average travel speed, ATSD	31.2	mi/h
Percent Free Flow Speed, PFFS	71.6	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	827 pc/h	569 pc/h
Base percent time-spent-following,(note-4) BPTSFd	67.7	%
Adjustment for no-passing zones, fnp	25.6	
Percent time-spent-following, PTSFd	82.9	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.49
Peak 15-min vehicle-miles of travel, VMT15	207 veh-mi
Peak-hour vehicle-miles of travel, VMT60	777 veh-mi
Peak 15-min total travel time, TT15	6.6 veh-h
Capacity from ATS, CdATS	1681 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1681 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	31.2	mi/h
Percent time-spent-following, PTSFd (from above)	82.9	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 826.6
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 7.66
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Volvo Car Drive (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	6.0 ft	% Trucks and buses	10 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	20 %
Up/down	- %	Access point density	8 /mi

Analysis direction volume, Vd 492 veh/h
Opposing direction volume, Vo 112 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.2	1.8
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.980	0.926
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	546 pc/h	131 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 0.0 mi/h
Adj. for access point density,(note-3) fA 2.0 mi/h

Free-flow speed, FFSd	48.0	mi/h
Adjustment for no-passing zones, fnp	0.4	mi/h
Average travel speed, ATSD	42.3	mi/h
Percent Free Flow Speed, PFFS	88.1	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	0.990
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	535 pc/h	123 pc/h
Base percent time-spent-following,(note-4) BPTSFd	46.9	%
Adjustment for no-passing zones, fnp	21.6	
Percent time-spent-following, PTSFd	64.5	%

Level of Service and Other Performance Measures

Level of service, LOS	B
Volume to capacity ratio, v/c	0.32
Peak 15-min vehicle-miles of travel, VMT15	134 veh-mi
Peak-hour vehicle-miles of travel, VMT60	492 veh-mi
Peak 15-min total travel time, TT15	3.2 veh-h
Capacity from ATS, CdATS	1574 veh/h
Capacity from PTSF, CdPTSF	1683 veh/h
Directional Capacity	1574 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	42.3	mi/h
Percent time-spent-following, PTSFd (from above)	64.5	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 534.8
Effective width of outside lane, We 24.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.13
Bicycle LOS E

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 27 (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.93
Shoulder width	1.0 ft	% Trucks and buses	16 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	30 /mi

Analysis direction volume, Vd 415 veh/h
Opposing direction volume, Vo 379 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.3	1.3
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.954	0.954
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	468 pc/h	427 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 7.5 mi/h

Free-flow speed, FFSd	43.3	mi/h
Adjustment for no-passing zones, fnp	2.6	mi/h
Average travel speed, ATSD	33.8	mi/h
Percent Free Flow Speed, PFFS	78.0	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	446 pc/h	408 pc/h
Base percent time-spent-following,(note-4) BPTSFd	45.4	%
Adjustment for no-passing zones, fnp	43.9	
Percent time-spent-following, PTSFd	68.3	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.27
Peak 15-min vehicle-miles of travel, VMT15	112 veh-mi
Peak-hour vehicle-miles of travel, VMT60	415 veh-mi
Peak 15-min total travel time, TT15	3.3 veh-h
Capacity from ATS, CdATS	1622 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1622 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	33.8	mi/h
Percent time-spent-following, PTSFd (from above)	68.3	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 446.2
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 9.87
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
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Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 27 (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.91
Shoulder width	2.5 ft	% Trucks and buses	16 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	10 /mi

Analysis direction volume, Vd 526 veh/h
Opposing direction volume, Vo 363 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.3
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.984	0.954
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	587 pc/h	418 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 2.5 mi/h

Free-flow speed, FFSd	49.5	mi/h
Adjustment for no-passing zones, fnp	2.6	mi/h
Average travel speed, ATSD	39.1	mi/h
Percent Free Flow Speed, PFFS	78.9	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	0.984
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	578 pc/h	405 pc/h
Base percent time-spent-following,(note-4) BPTSFd	53.9	%
Adjustment for no-passing zones, fnp	37.4	
Percent time-spent-following, PTSFd	75.9	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.35
Peak 15-min vehicle-miles of travel, VMT15	145 veh-mi
Peak-hour vehicle-miles of travel, VMT60	526 veh-mi
Peak 15-min total travel time, TT15	3.7 veh-h
Capacity from ATS, CdATS	1622 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1622 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	39.1	mi/h
Percent time-spent-following, PTSFd (from above)	75.9	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 578.0
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 9.87
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 453 (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	1.0 ft	% Trucks and buses	36 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	75 %
Up/down	- %	Access point density	4 /mi

Analysis direction volume, Vd 196 veh/h
Opposing direction volume, Vo 127 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.5	1.7
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.847	0.799
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	252 pc/h	173 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.7 mi/h
Adj. for access point density,(note-3) fA 1.0 mi/h

Free-flow speed, FFSd	39.3	mi/h
Adjustment for no-passing zones, fnp	3.2	mi/h
Average travel speed, ATSD	32.8	mi/h
Percent Free Flow Speed, PFFS	83.4	%

Percent Time-Spent-Following

Direction	Analysis(d)	Oposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.965	0.965
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	221 pc/h	143 pc/h
Base percent time-spent-following,(note-4) BPTSFd	23.5	%
Adjustment for no-passing zones, fnp	53.7	
Percent time-spent-following, PTSFd	56.1	%

Level of Service and Other Performance Measures

Level of service, LOS	B
Volume to capacity ratio, v/c	0.15
Peak 15-min vehicle-miles of travel, VMT15	53 veh-mi
Peak-hour vehicle-miles of travel, VMT60	196 veh-mi
Peak 15-min total travel time, TT15	1.6 veh-h
Capacity from ATS, CdATS	1358 veh/h
Capacity from PTSF, CdPTSF	1641 veh/h
Directional Capacity	1358 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.8	mi/h
Percent time-spent-following, PTSFd (from above)	56.1	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 213.0
Effective width of outside lane, We 12.50
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 24.27
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 453 (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	36 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	70 %
Up/down	- %	Access point density	16 /mi

Analysis direction volume, Vd 190 veh/h
Opposing direction volume, Vo 159 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.5	1.6
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.847	0.822
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	249 pc/h	215 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 4.0 mi/h

Free-flow speed, FFSd	36.8	mi/h
Adjustment for no-passing zones, fnp	3.4	mi/h
Average travel speed, ATSD	29.8	mi/h
Percent Free Flow Speed, PFFS	81.1	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.965	0.965
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	219 pc/h	183 pc/h
Base percent time-spent-following,(note-4) BPTSFd	23.3	%
Adjustment for no-passing zones, fnp	58.9	
Percent time-spent-following, PTSFd	55.4	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.15
Peak 15-min vehicle-miles of travel, VMT15	53 veh-mi
Peak-hour vehicle-miles of travel, VMT60	190 veh-mi
Peak 15-min total travel time, TT15	1.8 veh-h
Capacity from ATS, CdATS	1397 veh/h
Capacity from PTSF, CdPTSF	1641 veh/h
Directional Capacity	1397 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	29.8	mi/h
Percent time-spent-following, PTSFd (from above)	55.4	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 211.1
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 24.20
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Jedburg Road (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.93
Shoulder width	2.5 ft	% Trucks and buses	11 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 562 veh/h
Opposing direction volume, Vo 352 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.3
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.989	0.968
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	611 pc/h	391 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	2.8	mi/h
Average travel speed, ATSD	33.0	mi/h
Percent Free Flow Speed, PFFS	75.8	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	0.989
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	604 pc/h	383 pc/h
Base percent time-spent-following,(note-4) BPTSFd	54.8	%
Adjustment for no-passing zones, fnp	36.1	
Percent time-spent-following, PTSFd	76.9	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.36
Peak 15-min vehicle-miles of travel, VMT15	151 veh-mi
Peak-hour vehicle-miles of travel, VMT60	562 veh-mi
Peak 15-min total travel time, TT15	4.6 veh-h
Capacity from ATS, CdATS	1646 veh/h
Capacity from PTSF, CdPTSF	1682 veh/h
Directional Capacity	1646 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	33.0	mi/h
Percent time-spent-following, PTSFd (from above)	76.9	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 604.3
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 7.50
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Jedburg Road (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.94
Shoulder width	2.5 ft	% Trucks and buses	11 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	60 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 535 veh/h
Opposing direction volume, Vo 777 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.989	0.989
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	575 pc/h	836 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	0.8	mi/h
Average travel speed, ATSD	31.8	mi/h
Percent Free Flow Speed, PFFS	73.1	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	569 pc/h	827 pc/h
Base percent time-spent-following,(note-4) BPTSFd	59.4	%
Adjustment for no-passing zones, fnp	25.6	
Percent time-spent-following, PTSFd	69.8	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.34
Peak 15-min vehicle-miles of travel, VMT15	142 veh-mi
Peak-hour vehicle-miles of travel, VMT60	535 veh-mi
Peak 15-min total travel time, TT15	4.5 veh-h
Capacity from ATS, CdATS	1681 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1681 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	31.8	mi/h
Percent time-spent-following, PTSFd (from above)	69.8	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 569.1
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 7.47
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Volvo Car Drive (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	6.0 ft	% Trucks and buses	10 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	20 %
Up/down	- %	Access point density	8 /mi

Analysis direction volume, Vd 112 veh/h
Opposing direction volume, Vo 492 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.8	1.2
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.926	0.980
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	131 pc/h	546 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 0.0 mi/h
Adj. for access point density,(note-3) fA 2.0 mi/h

Free-flow speed, FFSd	48.0	mi/h
Adjustment for no-passing zones, fnp	0.7	mi/h
Average travel speed, ATSD	42.1	mi/h
Percent Free Flow Speed, PFFS	87.7	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.990	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	123 pc/h	535 pc/h
Base percent time-spent-following,(note-4) BPTSFd	18.7	%
Adjustment for no-passing zones, fnp	21.6	
Percent time-spent-following, PTSFd	22.7	%

Level of Service and Other Performance Measures

Level of service, LOS	B
Volume to capacity ratio, v/c	0.08
Peak 15-min vehicle-miles of travel, VMT15	30 veh-mi
Peak-hour vehicle-miles of travel, VMT60	112 veh-mi
Peak 15-min total travel time, TT15	0.7 veh-h
Capacity from ATS, CdATS	1666 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1666 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	42.1	mi/h
Percent time-spent-following, PTSFd (from above)	22.7	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 121.7
Effective width of outside lane, We 31.92
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 2.16
Bicycle LOS B

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 27 (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.93
Shoulder width	1.0 ft	% Trucks and buses	16 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	30 /mi

Analysis direction volume, Vd 379 veh/h
Opposing direction volume, Vo 415 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.3	1.3
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.954	0.954
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	427 pc/h	468 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 7.5 mi/h

Free-flow speed, FFSd	43.3	mi/h
Adjustment for no-passing zones, fnp	2.4	mi/h
Average travel speed, ATSD	34.0	mi/h
Percent Free Flow Speed, PFFS	78.4	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	408 pc/h	446 pc/h
Base percent time-spent-following,(note-4) BPTSFd	45.0	%
Adjustment for no-passing zones, fnp	43.9	
Percent time-spent-following, PTSFd	66.0	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.25
Peak 15-min vehicle-miles of travel, VMT15	102 veh-mi
Peak-hour vehicle-miles of travel, VMT60	379 veh-mi
Peak 15-min total travel time, TT15	3.0 veh-h
Capacity from ATS, CdATS	1622 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1622 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	34.0	mi/h
Percent time-spent-following, PTSFd (from above)	66.0	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 407.5
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 9.83
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 27 (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.91
Shoulder width	2.5 ft	% Trucks and buses	16 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	10 /mi

Analysis direction volume, Vd 363 veh/h
Opposing direction volume, Vo 526 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.3	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.954	0.984
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	418 pc/h	587 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 2.5 mi/h

Free-flow speed, FFSd	49.5	mi/h
Adjustment for no-passing zones, fnp	1.9	mi/h
Average travel speed, ATSD	39.8	mi/h
Percent Free Flow Speed, PFFS	80.3	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.984	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	405 pc/h	578 pc/h
Base percent time-spent-following,(note-4) BPTSFd	46.0	%
Adjustment for no-passing zones, fnp	37.4	
Percent time-spent-following, PTSFd	61.4	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.25
Peak 15-min vehicle-miles of travel, VMT15	100 veh-mi
Peak-hour vehicle-miles of travel, VMT60	363 veh-mi
Peak 15-min total travel time, TT15	2.5 veh-h
Capacity from ATS, CdATS	1673 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1673 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	39.8	mi/h
Percent time-spent-following, PTSFd (from above)	61.4	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 398.9
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 9.68
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 453 (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	1.0 ft	% Trucks and buses	36 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	75 %
Up/down	- %	Access point density	4 /mi

Analysis direction volume, Vd 127 veh/h
Opposing direction volume, Vo 196 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.7	1.5
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.799	0.847
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	173 pc/h	252 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.7 mi/h
Adj. for access point density,(note-3) fA 1.0 mi/h

Free-flow speed, FFSd	39.3	mi/h
Adjustment for no-passing zones, fnp	3.3	mi/h
Average travel speed, ATSD	32.7	mi/h
Percent Free Flow Speed, PFFS	83.2	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.965	0.965
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	143 pc/h	221 pc/h
Base percent time-spent-following,(note-4) BPTSFd	16.7	%
Adjustment for no-passing zones, fnp	53.7	
Percent time-spent-following, PTSFd	37.8	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.10
Peak 15-min vehicle-miles of travel, VMT15	35 veh-mi
Peak-hour vehicle-miles of travel, VMT60	127 veh-mi
Peak 15-min total travel time, TT15	1.1 veh-h
Capacity from ATS, CdATS	1440 veh/h
Capacity from PTSF, CdPTSF	1641 veh/h
Directional Capacity	1440 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.7	mi/h
Percent time-spent-following, PTSFd (from above)	37.8	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 138.0
Effective width of outside lane, We 17.06
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 23.38
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 453 (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	36 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	70 %
Up/down	- %	Access point density	16 /mi

Analysis direction volume, Vd 159 veh/h
Opposing direction volume, Vo 190 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.6	1.5
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.822	0.847
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	215 pc/h	249 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 4.0 mi/h

Free-flow speed, FFSd	36.8	mi/h
Adjustment for no-passing zones, fnp	3.2	mi/h
Average travel speed, ATSD	30.0	mi/h
Percent Free Flow Speed, PFFS	81.6	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.965	0.965
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	183 pc/h	219 pc/h
Base percent time-spent-following,(note-4) BPTSFd	20.7	%
Adjustment for no-passing zones, fnp	58.9	
Percent time-spent-following, PTSFd	47.5	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.13
Peak 15-min vehicle-miles of travel, VMT15	44 veh-mi
Peak-hour vehicle-miles of travel, VMT60	159 veh-mi
Peak 15-min total travel time, TT15	1.5 veh-h
Capacity from ATS, CdATS	1440 veh/h
Capacity from PTSF, CdPTSF	1641 veh/h
Directional Capacity	1440 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	30.0	mi/h
Percent time-spent-following, PTSFd (from above)	47.5	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 176.7
Effective width of outside lane, We 15.66
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 23.73
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2010	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	31	vph
Length of first accel/decel lane	465	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	163	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2010	31	163	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v_{15}	546	9	45	v
Trucks and buses	10	52	24	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.794	0.893	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2294	43	203	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 2294$ pc/h

$v_{12} = 2294$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	2294	4800	No
$v_{12} = v_F - v_R$	2251	4800	No
$v_{12} = v_F + v_R$	43	2000	No
v_{12} or v_{12}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_{12} or $v_{12} > 2700$ pc/h?		No	
Is v_{12} or $v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 2294$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2294	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 19.8$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.432$

S

Space mean speed in ramp influence area, $S = 57.9$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 57.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2142	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	135	vph
Length of first accel/decel lane	450	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	519	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2142	135	519	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v_{15}	582	38	144	v
Trucks and buses	10	8	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.962	0.966	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2445	156	597	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 2445$ pc/h

$v_{12} = 2445$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	2445	4800	No
$v_{12} = v_F - v_R$	2289	4800	No
$v_{12} = v_R$	156	2000	No
$v_{12} \text{ or } v_{12}$	0 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_{12} > 2700$ pc/h?		No	
Is $v_{12} \text{ or } v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 2445$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2445	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 21.2$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.442$

S

Space mean speed in ramp influence area, $S = 57.6$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 57.6 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2526	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	31	vph
Length of first accel/decel lane	1200	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	378	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	3500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2526	31	378	vph
Peak-hour factor, PHF	0.92	0.92	0.92	

Peak 15-min volume, v_{15}	686	8	103	v
Trucks and buses	10	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2883	35	431	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_R + (v_F - v_R) P = 2883$ pc/h

$v_{12} = 2883$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_R$	2883	4800	No
$v_{12} = v_F$			
$v_{12} = v_F - v_R$	2848	4800	No
$v_{12} = v_F - v_R$			
$v_{12} = v_F$	35	2000	No
$v_{12} = v_F$			
$v_{12} = v_F$ or $v_{12} = v_F$	0 pc/h	(Equation 13-14 or 13-17)	
$v_{12} = v_F$ or $v_{12} = v_F$			
Is $v_{12} = v_F$ or $v_{12} = v_F$ > 2700 pc/h?		No	
Is $v_{12} = v_F$ or $v_{12} = v_F$ > 1.5 $v_{12} / 2$		No	
If yes, $v_{12} = 2883$		(Equation 13-15, 13-16, 13-18, or 13-19)	
$v_{12} = 2883$			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2883	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 18.2$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.431$

S

Space mean speed in ramp influence area, $S = 57.9$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 57.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2873	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	158	vph
Length of first accel/decel lane	180	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	644	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2900	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2873	158	644	vph
Peak-hour factor, PHF	0.92	0.91	0.90	

Peak 15-min volume, v_{15}	781	43	179	v
Trucks and buses	10	19	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.913	0.966	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3279	190	741	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.669$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 2257$ pc/h

$v_{12} = 2257$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	3279	7200	No
$v_{12} = v_F + v_R$	3089	7200	No
$v_{12} = v_F + v_R$	190	2000	No
$v_{12} = v_F + v_R$	1022 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} > 2700$ pc/h?	No		
Is $v_{12} > 1.5 v_F / 2$	No		
If yes, $v_{12} = 2257$	(Equation 13-15, 13-16, 13-18, or 13-19)		

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2257	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 22.0$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.445$

S

Space mean speed in ramp influence area, $S = 57.5$ mph

R

Space mean speed in outer lanes, S = 76.7 mph

0

Space mean speed for all vehicles, S = 62.4 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3490	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	627	vph
Length of first accel/decel lane	850	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	155	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	750	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3490	627	155	vph
Peak-hour factor, PHF	0.93	0.95	0.90	

Peak 15-min volume, v_{15}	938	165	43	v
Trucks and buses	15	6	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.971	0.966	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	4034	680	178	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.628$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 2786$ pc/h

$v_{12} = 2786$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	4034	7200	No
$v_{12} = v_F - v_R$	3354	7200	No
$v_{12} = v_R$	680	2000	No
v_{12} or v_{12}	1248 pc/h	(Equation 13-14 or 13-17)	
v_{12} or v_{12}	> 2700 pc/h?	No	
v_{12} or v_{12}	$> 1.5 v_{12} / 2$	No	
If yes, $v_{12} = 2786$	(Equation 13-15, 13-16, 13-18, or 13-19)		

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2786	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 20.6$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.489$

S

Space mean speed in ramp influence area, $S = 56.3$ mph

R

Space mean speed in outer lanes, S = 75.8 mph

0

Space mean speed for all vehicles, S = 61.2 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3767	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	277	vph
Length of first accel/decel lane	150	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	627	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	920	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3767	277	627	vph
Peak-hour factor, PHF	0.93	0.95	0.95	

Peak 15-min volume, v_{15}	1013	73	165	v
Trucks and buses	15	6	6	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	4354	300	680	pcph

Estimation of V12 Diverge Areas

$$L = 755.98 \text{ (Equation 13-12 or 13-13)}$$

EQ

$$P = 0.637 \text{ Using Equation 5}$$

FD

$$v_{12} = v_F + (v_R - v_F) P = 2884 \text{ pc/h}$$

$$v_{12} = v_F + (v_R - v_F) P = 2884 \text{ pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	4354	7200	No
$v_{12} = v_F - v_R$	4054	7200	No
$v_{12} = v_F$	300	2000	No
$v_{12} \text{ or } v_{12}$	1470 pc/h	(Equation 13-14 or 13-17)	
$v_{12} \text{ or } v_{12}$	$> 2700 \text{ pc/h?}$	No	
$v_{12} \text{ or } v_{12}$	$> 1.5 v_{12} / 2$	No	
If yes, $v_{12} = 2884$	(Equation 13-15, 13-16, 13-18, or 13-19)		

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2884	4400	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L = 27.7 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

$$\text{Intermediate speed variable, } D = 0.455$$

S

$$\text{Space mean speed in ramp influence area, } S = 57.3 \text{ mph}$$

R

Space mean speed in outer lanes, S = 75.0 mph

0

Space mean speed for all vehicles, S = 62.2 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3018	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	124	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane	1500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	94	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3018	124	94	vph
Peak-hour factor, PHF	0.93	0.92	0.92	

Peak 15-min volume, v_{15}	811	34	26	v
Trucks and buses	15	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3489	142	107	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 3489$ pc/h

$v_{12} = 3489$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	3489	4800	No
$v_{12} = v_F - v_R$	3347	4800	No
$v_{12} = v_F$	142	4000	No
$v_{12} = v_F$	0 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} > 2700$ pc/h?	No		
Is $v_{12} > 1.5 v_{12} / 2$	No		
If yes, $v_{12} = 3489$	(Equation 13-15, 13-16, 13-18, or 13-19)		

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3489	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = -6.2$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable, $D = 0.441$

S

Space mean speed in ramp influence area, $S = 57.7$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 57.7 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2988	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	508	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	155	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2988	508	155	vph
Peak-hour factor, PHF	0.93	0.91	0.90	

Peak 15-min volume, v_{15}	803	140	43	v
Trucks and buses	15	7	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.966	0.966	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3454	578	178	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 3454$ pc/h

$v_{12} = 3454$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	3454	4800	No
$v_{12} = v_F$			
$v_{12} = v_F - v_R$	2876	4800	No
$v_{12} = v_F - v_R$			
$v_{12} = v_F$	578	2000	No
$v_{12} = v_F$			
$v_{12} = v_F$	0 pc/h	(Equation 13-14 or 13-17)	
$v_{12} = v_F$			
Is $v_{12} = v_F > 2700$ pc/h?		No	
$v_{12} = v_F$			
Is $v_{12} = v_F > 1.5 v_{12} / 2$		No	
$v_{12} = v_F$			
If yes, $v_{12} = 3454$		(Equation 13-15, 13-16, 13-18, or 13-19)	
$v_{12} = 3454$			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3454	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 29.5$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable, $D = 0.480$

S

Space mean speed in ramp influence area, $S = 56.6$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 56.6 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2635	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	166	vph
Length of first accel/decel lane	475	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	57	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2635	166	57	vph
Peak-hour factor, PHF	0.93	0.90	0.90	

Peak 15-min volume, v_{15}	708	46	16	v
Trucks and buses	15	21	24	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.905	0.893	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3046	204	71	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 3046$ pc/h

$v_{12} = 3046$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	3046	4800	No
$v_{12} = v_F - v_R$	2842	4800	No
$v_{12} = v_F$	204	2000	No
$v_{12} \text{ or } v_R$	0 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_R > 2700$ pc/h?		No	
Is $v_{12} \text{ or } v_R > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 3046$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3046	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 26.2$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.446$

S

Space mean speed in ramp influence area, $S = 57.5$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 57.5 mph

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: West of SC 453
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2010	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	546	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1147	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.2	mi/h
Free-flow speed, FFS	72.2	mi/h

LOS and Performance Measures

Flow rate, vp	1147	pc/h/ln
Free-flow speed, FFS	72.2	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	2	
Density, D	16.4	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Between SC 453 Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1979	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	538	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1129	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.33	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.3	mi/h
Free-flow speed, FFS	74.1	mi/h

LOS and Performance Measures

Flow rate, vp	1129	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	74.8	mi/h
Number of lanes, N	2	
Density, D	15.1	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: SC 453 to SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2142	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	582	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1222	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	1222	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	74.5	mi/h
Number of lanes, N	2	
Density, D	16.4	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Between SC 27 Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2007	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	545	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1145	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1145	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	74.8	mi/h
Number of lanes, N	2	
Density, D	15.3	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Between SC 27 & Volvo
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2526	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	686	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1441	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1441	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	72.8	mi/h
Number of lanes, N	2	
Density, D	19.8	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Between Volvo Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2495	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	678	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1424	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1424	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	73.0	mi/h
Number of lanes, N	2	
Density, D	19.5	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Volvo to Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2873	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	781	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1639	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1639	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	70.5	mi/h
Number of lanes, N	2	
Density, D	23.3	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2715	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	738	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1033	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.50	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.8	mi/h
Free-flow speed, FFS	73.6	mi/h

LOS and Performance Measures

Flow rate, vp	1033	pc/h/ln
Free-flow speed, FFS	73.6	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	13.8	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Jedburg to Nexton
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3359	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	913	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1278	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.20	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.8	mi/h
Free-flow speed, FFS	71.6	mi/h

LOS and Performance Measures

Flow rate, vp	1278	pc/h/ln
Free-flow speed, FFS	71.6	mi/h
Average passenger-car speed, S	69.9	mi/h
Number of lanes, N	3	
Density, D	18.3	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Nexton to Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3767	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	1013	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1451	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.33	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	4.1	mi/h
Free-flow speed, FFS	71.3	mi/h

LOS and Performance Measures

Flow rate, vp	1451	pc/h/ln
Free-flow speed, FFS	71.3	mi/h
Average passenger-car speed, S	69.3	mi/h
Number of lanes, N	3	
Density, D	20.9	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
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Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2863	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	770	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1103	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1103	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	74.9	mi/h
Number of lanes, N	3	
Density, D	14.7	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3490	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	938	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1345	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1345	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	73.7	mi/h
Number of lanes, N	3	
Density, D	18.3	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Jeddburg to Volvo
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3018	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	811	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1744	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	1744	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	68.9	mi/h
Number of lanes, N	2	
Density, D	25.3	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between Volvo Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2894	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	778	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1673	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1673	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	2	
Density, D	23.9	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between Volvo & SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2988	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	803	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1727	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1727	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	69.1	mi/h
Number of lanes, N	2	
Density, D	25.0	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between SC 27 Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2480	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	667	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1433	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1433	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	72.9	mi/h
Number of lanes, N	2	
Density, D	19.7	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: SC 27 to SC 453
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2635	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	708	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1523	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	1523	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	72.0	mi/h
Number of lanes, N	2	
Density, D	21.2	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between SC 453 Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2469	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	664	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1427	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.33	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.3	mi/h
Free-flow speed, FFS	74.1	mi/h

LOS and Performance Measures

Flow rate, vp	1427	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	73.0	mi/h
Number of lanes, N	2	
Density, D	19.6	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: West of SC 453
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2526	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	679	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1460	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.2	mi/h
Free-flow speed, FFS	72.2	mi/h

LOS and Performance Measures

Flow rate, vp	1460	pc/h/ln
Free-flow speed, FFS	72.2	mi/h
Average passenger-car speed, S	69.2	mi/h
Number of lanes, N	2	
Density, D	21.1	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1979	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	163	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	31	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
	Ramp			
Volume, V (vph)	1979	163	31	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v_{15}	538	45	9	v
Trucks and buses	10	24	52	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.893	0.794	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2259	203	43	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)

EQ

$P = 1.000$ Using Equation 0

FM

$v_{12} = v_{12} (P) = 2259$ pc/h

FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	2462	4800	No
FO			
v_{12} or v_{12}	0 pc/h	(Equation 13-14 or 13-17)	
v_{12} or v_{12}			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
Is v_{12} or v_{12}	$> 1.5 v_{12} / 2$	No	
If yes, v_{12}	$= 2259$	(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2462	4600	No
R12			

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 19.6$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.311$

S

Space mean speed in ramp influence area, $S = 61.3$ mph

R

Space mean speed in outer lanes, $S = N/A$ mph

0

Space mean speed for all vehicles, $S = 61.3$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2007	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	519	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	135	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2007	519	135	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v_{15}	545	144	38	v
Trucks and buses	10	7	8	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.966	0.962	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2291	597	156	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)

EQ

$P = 1.000$ Using Equation 0

FM

$v_{12} = v_{12} (P) = 2291$ pc/h

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	2888	4800	No
FO			
v_{12} or v_{12}	0 pc/h	(Equation 13-14 or 13-17)	
3 av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
3 av34			
Is v_{12} or v_{12}	> 1.5 $v_{12} / 2$	No	
3 av34	12		
If yes, $v_{12} = 2291$	(Equation 13-15, 13-16, 13-18, or 13-19)		
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2888	4600	No
R12			

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 22.7$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $M = 0.335$

S

Space mean speed in ramp influence area, $S = 60.6$ mph

R

Space mean speed in outer lanes, $S = N/A$ mph

0

Space mean speed for all vehicles, $S = 60.6$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2495	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-flow speed on ramp	35.0	mph
Volume on ramp	378	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane	1500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	31	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	3500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
	Ramp			
Volume, V (vph)	2495	378	31	vph
Peak-hour factor, PHF	0.92	0.92	0.92	

Peak 15-min volume, v ₁₅	678	103	8	v
Trucks and buses	10	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.952	0.952	0.952	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	2848	431	35	pcph

Estimation of V₁₂ Merge Areas

L = (Equation 13-6 or 13-7)

EQ

P = 1.000 Using Equation 0

FM

v = v₁₂ (P) = 2848 pc/h

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v	3279	4800	No
FO			
v or v ₃	0 pc/h	(Equation 13-14 or 13-17)	
av ₃₄			
Is v or v ₃	> 2700 pc/h?	No	
av ₃₄			
Is v or v ₃	> 1.5 v ₁₂ / 2	No	
av ₃₄			
If yes, v _{12A}	= 2848	(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v	3279	4600	No
R ₁₂			

Level of Service Determination (if not F)

Density, D = $5.475 + 0.00734 v_R + 0.0078 v_A - 0.00627 L$ = 2.6 pc/mi/ln

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable, M = 0.110

S

Space mean speed in ramp influence area, S = 66.9 mph

R

Space mean speed in outer lanes, S = N/A mph

0

Space mean speed for all vehicles, S = 66.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2715	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	644	vph
Length of first accel/decel lane	1120	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	158	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2900	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2715	644	158	vph
Peak-hour factor, PHF	0.92	0.90	0.91	

Peak 15-min volume, v_{15}	738	179	43	v
Trucks and buses	10	7	19	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.966	0.913	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3099	741	190	pcph

Estimation of V12 Merge Areas

$$L = 747.24 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.609 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 1887 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	3840	7200	No
FO			
v_{12} or v_{12}	1212 pc/h	(Equation 13-14 or 13-17)	
3 av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
3 av34			
Is v_{12} or v_{12}	> 1.5 $v_{12} / 2$	Yes	
3 av34	12		
If yes, v_{12}	= 1887	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2628	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 18.6 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

$$\text{Intermediate speed variable, } M = 0.297$$

S

$$\text{Space mean speed in ramp influence area, } S = 61.7 \text{ mph}$$

R

$$\text{Space mean speed in outer lanes, } S = 67.4 \text{ mph}$$

0

$$\text{Space mean speed for all vehicles, } S = 63.4 \text{ mph}$$

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2863	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	155	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	627	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	750	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2863	155	627	vph
Peak-hour factor, PHF	0.93	0.90	0.95	

Peak 15-min volume, v_{15}	770	43	165	v
Trucks and buses	15	7	6	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.966	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3309	178	680	pcph

Estimation of V12 Merge Areas

$$L = 840.42 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.614 \text{ Using Equation 2}$$

FM

$$v_{12} = v_{12} (P) = 2031 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	3487	7200	No
FO			
v_{12} or v_{12}	1278 pc/h	(Equation 13-14 or 13-17)	
3 av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
3 av34			
Is v_{12} or v_{12}	> 1.5 $v_{12} / 2$	Yes	
3 av34	12		
If yes, v_{12}	= 2031	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2209	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 13.2 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.252$

S

Space mean speed in ramp influence area, $S = 63.0 \text{ mph}$

R

Space mean speed in outer lanes, $S = 67.2 \text{ mph}$

0

Space mean speed for all vehicles, $S = 64.4 \text{ mph}$

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2894	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	94	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	124	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2894	94	124	vph
Peak-hour factor, PHF	0.93	0.92	0.92	

Peak 15-min volume, v ₁₅	778	26	34	v
Trucks and buses	15	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.930	0.952	0.952	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	3345	107	142	pcph

Estimation of V₁₂ Merge Areas

L = (Equation 13-6 or 13-7)

EQ

P = 1.000 Using Equation 0

FM

v = v₁₂ (P) = 3345 pc/h

FM

Capacity Checks

	Actual	Maximum	LOS F?
v	3452	4800	No
FO			
v or v ₃	0 pc/h	(Equation 13-14 or 13-17)	
av ₃₄			
Is v or v ₃	> 2700 pc/h?	No	
av ₃₄			
Is v or v ₃	> 1.5 v ₁₂ / 2	No	
av ₃₄			
If yes, v _{12A}	= 3345	(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v	3452	4600	No
R ₁₂			

Level of Service Determination (if not F)

Density, D = $5.475 + 0.00734 v_R + 0.0078 v_A - 0.00627 L$ = 22.9 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, M = 0.339

S

Space mean speed in ramp influence area, S = 60.5 mph

R

Space mean speed in outer lanes, S = N/A mph

0

Space mean speed for all vehicles, S = 60.5 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2480	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	155	vph
Length of first accel/decel lane	900	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	508	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2480	155	508	vph
Peak-hour factor, PHF	0.93	0.90	0.91	

Peak 15-min volume, v_{15}	667	43	140	v
Trucks and buses	15	7	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.966	0.966	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2867	178	578	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)

EQ

$P = 1.000$ Using Equation 0

FM

$v_{12} = v_{15} (P_{FM}) = 2867$ pc/h

12 F FM

Capacity Checks

v_{12}	Actual 3045	Maximum 4800	LOS F? No
FO			
v_{12} or v_{15}	0 pc/h	(Equation 13-14 or 13-17)	
$\frac{v_{12}}{3}$ or $\frac{v_{15}}{3}$			
Is v_{12} or v_{15}	> 2700 pc/h?	No	
$\frac{v_{12}}{3}$ or $\frac{v_{15}}{3}$			
Is v_{12} or v_{15}	$> 1.5 \frac{v_{12}}{12}$	No	
$\frac{v_{12}}{3}$ or $\frac{v_{15}}{3}$			
If yes, $v_{12} = 2867$ (Equation 13-15, 13-16, 13-18, or 13-19)			
12A			

Flow Entering Merge Influence Area

v_{12}	Actual 3045	Max Desirable 4600	Violation? No
R12			

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 \frac{v_{12}}{R} + 0.0078 \frac{v_{15}}{A} - 0.00627 L = 23.5$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $M = 0.340$

S

Space mean speed in ramp influence area, $S_R = 60.5$ mph

R

Space mean speed in outer lanes, $S_0 = \text{N/A}$ mph

0

Space mean speed for all vehicles, $S = 60.5$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2469	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	57	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	166	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2469	57	166	vph
Peak-hour factor, PHF	0.93	0.90	0.90	

Peak 15-min volume, v_{15}	664	16	46	v
Trucks and buses	15	24	21	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.893	0.905	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2854	71	204	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)

EQ

$P = 1.000$ Using Equation 0

FM

$v_{12} = v_{12} (P) = 2854$ pc/h

FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	2925	4800	No
FO			
v_{12} or v_{12}	0 pc/h	(Equation 13-14 or 13-17)	
v_{12} or v_{12}			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
Is v_{12} or v_{12}	> 1.5 $v_{12} / 2$	No	
If yes, v_{12}	= 2854	(Equation 13-15, 13-16, 13-18, or 13-19)	
	12A		

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2925	4600	No
R12			

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 23.2$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $M = 0.338$

S

Space mean speed in ramp influence area, $S = 60.5$ mph

R

Space mean speed in outer lanes, $S = N/A$ mph

0

Space mean speed for all vehicles, $S = 60.5$ mph

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Jedburg Road (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.95
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 561 veh/h
Opposing direction volume, Vo 407 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.3
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.993	0.979
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	595 pc/h	438 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	2.5	mi/h
Average travel speed, ATSD	33.0	mi/h
Percent Free Flow Speed, PFFS	75.8	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	591 pc/h	428 pc/h
Base percent time-spent-following,(note-4) BPTSFd	56.4	%
Adjustment for no-passing zones, fnp	37.0	
Percent time-spent-following, PTSFd	77.9	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.35
Peak 15-min vehicle-miles of travel, VMT15	148 veh-mi
Peak-hour vehicle-miles of travel, VMT60	561 veh-mi
Peak 15-min total travel time, TT15	4.5 veh-h
Capacity from ATS, CdATS	1664 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1664 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	33.0	mi/h
Percent time-spent-following, PTSFd (from above)	77.9	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 590.5
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.95
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Jedburg Road (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	60 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 686 veh/h
Opposing direction volume, Vo 836 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.993	1.000
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	751 pc/h	909 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	0.7	mi/h
Average travel speed, ATSD	29.9	mi/h
Percent Free Flow Speed, PFFS	68.8	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	746 pc/h	909 pc/h
Base percent time-spent-following,(note-4) BPTSFd	68.2	%
Adjustment for no-passing zones, fnp	21.9	
Percent time-spent-following, PTSFd	78.1	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.44
Peak 15-min vehicle-miles of travel, VMT15	186 veh-mi
Peak-hour vehicle-miles of travel, VMT60	686 veh-mi
Peak 15-min total travel time, TT15	6.2 veh-h
Capacity from ATS, CdATS	1700 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1700 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	29.9	mi/h
Percent time-spent-following, PTSFd (from above)	78.1	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 745.7
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 6.07
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Volvo Car Drive (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	6.0 ft	% Trucks and buses	10 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	20 %
Up/down	- %	Access point density	8 /mi

Analysis direction volume, Vd 155 veh/h
Opposing direction volume, Vo 472 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.6	1.2
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.943	0.980
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	179 pc/h	524 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 0.0 mi/h
Adj. for access point density,(note-3) fA 2.0 mi/h

Free-flow speed, FFSd	48.0	mi/h
Adjustment for no-passing zones, fnp	0.7	mi/h
Average travel speed, ATSD	41.8	mi/h
Percent Free Flow Speed, PFFS	87.2	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.990	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	170 pc/h	513 pc/h
Base percent time-spent-following,(note-4) BPTSFd	24.0	%
Adjustment for no-passing zones, fnp	24.8	
Percent time-spent-following, PTSFd	30.2	%

Level of Service and Other Performance Measures

Level of service, LOS	B
Volume to capacity ratio, v/c	0.11
Peak 15-min vehicle-miles of travel, VMT15	42 veh-mi
Peak-hour vehicle-miles of travel, VMT60	155 veh-mi
Peak 15-min total travel time, TT15	1.0 veh-h
Capacity from ATS, CdATS	1666 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1666 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	41.8	mi/h
Percent time-spent-following, PTSFd (from above)	30.2	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 168.5
Effective width of outside lane, We 28.05
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 3.48
Bicycle LOS C

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 27 (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	7 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	30 /mi

Analysis direction volume, Vd 452 veh/h
Opposing direction volume, Vo 581 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.2	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.986	0.993
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	509 pc/h	650 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 7.5 mi/h

Free-flow speed, FFSd	43.3	mi/h
Adjustment for no-passing zones, fnp	1.6	mi/h
Average travel speed, ATSD	32.7	mi/h
Percent Free Flow Speed, PFFS	75.4	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	502 pc/h	646 pc/h
Base percent time-spent-following,(note-4) BPTSFd	53.3	%
Adjustment for no-passing zones, fnp	34.3	
Percent time-spent-following, PTSFd	68.3	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.30
Peak 15-min vehicle-miles of travel, VMT15	126 veh-mi
Peak-hour vehicle-miles of travel, VMT60	452 veh-mi
Peak 15-min total travel time, TT15	3.9 veh-h
Capacity from ATS, CdATS	1688 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1688 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.7	mi/h
Percent time-spent-following, PTSFd (from above)	68.3	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 502.2
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 6.01
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 27 (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	10 /mi

Analysis direction volume, Vd 414 veh/h
Opposing direction volume, Vo 504 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.2	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.986	0.993
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	467 pc/h	564 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 2.5 mi/h

Free-flow speed, FFSd	49.5	mi/h
Adjustment for no-passing zones, fnp	2.0	mi/h
Average travel speed, ATSD	39.5	mi/h
Percent Free Flow Speed, PFFS	79.7	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	460 pc/h	560 pc/h
Base percent time-spent-following,(note-4) BPTSFd	49.7	%
Adjustment for no-passing zones, fnp	38.1	
Percent time-spent-following, PTSFd	66.9	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.27
Peak 15-min vehicle-miles of travel, VMT15	115 veh-mi
Peak-hour vehicle-miles of travel, VMT60	414 veh-mi
Peak 15-min total travel time, TT15	2.9 veh-h
Capacity from ATS, CdATS	1688 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1688 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	39.5	mi/h
Percent time-spent-following, PTSFd (from above)	66.9	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 460.0
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.83
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 453 (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	24 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	75 %
Up/down	- %	Access point density	4 /mi

Analysis direction volume, Vd 156 veh/h
Opposing direction volume, Vo 180 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.6	1.5
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.874	0.893
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	198 pc/h	224 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.7 mi/h
Adj. for access point density,(note-3) fA 1.0 mi/h

Free-flow speed, FFSd	39.3	mi/h
Adjustment for no-passing zones, fnp	3.5	mi/h
Average travel speed, ATSD	32.6	mi/h
Percent Free Flow Speed, PFFS	82.8	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.977	0.977
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	177 pc/h	205 pc/h
Base percent time-spent-following,(note-4) BPTSFd	19.3	%
Adjustment for no-passing zones, fnp	59.3	
Percent time-spent-following, PTSFd	46.8	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.12
Peak 15-min vehicle-miles of travel, VMT15	43 veh-mi
Peak-hour vehicle-miles of travel, VMT60	156 veh-mi
Peak 15-min total travel time, TT15	1.3 veh-h
Capacity from ATS, CdATS	1518 veh/h
Capacity from PTSF, CdPTSF	1660 veh/h
Directional Capacity	1518 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.6	mi/h
Percent time-spent-following, PTSFd (from above)	46.8	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 173.3
Effective width of outside lane, We 15.25
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 13.97
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 453 (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	24 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	70 %
Up/down	- %	Access point density	16 /mi

Analysis direction volume, Vd 170 veh/h
Opposing direction volume, Vo 243 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.5	1.4
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.893	0.912
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	212 pc/h	296 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 4.0 mi/h

Free-flow speed, FFSd	36.8	mi/h
Adjustment for no-passing zones, fnp	2.9	mi/h
Average travel speed, ATSD	30.0	mi/h
Percent Free Flow Speed, PFFS	81.5	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.977	0.977
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	193 pc/h	276 pc/h
Base percent time-spent-following,(note-4) BPTSFd	22.7	%
Adjustment for no-passing zones, fnp	54.2	
Percent time-spent-following, PTSFd	45.0	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.12
Peak 15-min vehicle-miles of travel, VMT15	47 veh-mi
Peak-hour vehicle-miles of travel, VMT60	170 veh-mi
Peak 15-min total travel time, TT15	1.6 veh-h
Capacity from ATS, CdATS	1550 veh/h
Capacity from PTSF, CdPTSF	1660 veh/h
Directional Capacity	1550 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	30.0	mi/h
Percent time-spent-following, PTSFd (from above)	45.0	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 188.9
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 14.33
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Jedburg Road (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.95
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 407 veh/h
Opposing direction volume, Vo 561 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.3	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.979	0.993
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	438 pc/h	595 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	1.8	mi/h
Average travel speed, ATSD	33.7	mi/h
Percent Free Flow Speed, PFFS	77.4	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	428 pc/h	591 pc/h
Base percent time-spent-following,(note-4) BPTSFd	47.8	%
Adjustment for no-passing zones, fnp	37.0	
Percent time-spent-following, PTSFd	63.3	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.26
Peak 15-min vehicle-miles of travel, VMT15	107 veh-mi
Peak-hour vehicle-miles of travel, VMT60	407 veh-mi
Peak 15-min total travel time, TT15	3.2 veh-h
Capacity from ATS, CdATS	1688 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1688 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	33.7	mi/h
Percent time-spent-following, PTSFd (from above)	63.3	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 428.4
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.79
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Jedburg Road (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	60 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 836 veh/h
Opposing direction volume, Vo 686 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	1.000	0.993
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	909 pc/h	751 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	0.9	mi/h
Average travel speed, ATSD	29.7	mi/h
Percent Free Flow Speed, PFFS	68.3	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	909 pc/h	746 pc/h
Base percent time-spent-following,(note-4) BPTSFd	73.0	%
Adjustment for no-passing zones, fnp	21.9	
Percent time-spent-following, PTSFd	85.0	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.53
Peak 15-min vehicle-miles of travel, VMT15	227 veh-mi
Peak-hour vehicle-miles of travel, VMT60	836 veh-mi
Peak 15-min total travel time, TT15	7.6 veh-h
Capacity from ATS, CdATS	1688 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1688 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	29.7	mi/h
Percent time-spent-following, PTSFd (from above)	85.0	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 908.7
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 6.17
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Volvo Car Drive (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	6.0 ft	% Trucks and buses	10 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	20 %
Up/down	- %	Access point density	8 /mi

Analysis direction volume, Vd 472 veh/h
Opposing direction volume, Vo 155 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.2	1.6
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.980	0.943
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	524 pc/h	179 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 0.0 mi/h
Adj. for access point density,(note-3) fA 2.0 mi/h

Free-flow speed, FFSd	48.0	mi/h
Adjustment for no-passing zones, fnp	0.9	mi/h
Average travel speed, ATSD	41.7	mi/h
Percent Free Flow Speed, PFFS	86.8	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	0.990
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	513 pc/h	170 pc/h
Base percent time-spent-following,(note-4) BPTSFd	45.5	%
Adjustment for no-passing zones, fnp	24.8	
Percent time-spent-following, PTSFd	64.1	%

Level of Service and Other Performance Measures

Level of service, LOS	B
Volume to capacity ratio, v/c	0.31
Peak 15-min vehicle-miles of travel, VMT15	128 veh-mi
Peak-hour vehicle-miles of travel, VMT60	472 veh-mi
Peak 15-min total travel time, TT15	3.1 veh-h
Capacity from ATS, CdATS	1603 veh/h
Capacity from PTSF, CdPTSF	1683 veh/h
Directional Capacity	1603 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	41.7	mi/h
Percent time-spent-following, PTSFd (from above)	64.1	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 513.0
Effective width of outside lane, We 24.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.10
Bicycle LOS E

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 27 (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	7 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	30 /mi

Analysis direction volume, Vd 581 veh/h
Opposing direction volume, Vo 452 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.2
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.993	0.986
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	650 pc/h	509 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 7.5 mi/h

Free-flow speed, FFSd	43.3	mi/h
Adjustment for no-passing zones, fnp	2.2	mi/h
Average travel speed, ATSD	32.1	mi/h
Percent Free Flow Speed, PFFS	74.1	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	646 pc/h	502 pc/h
Base percent time-spent-following,(note-4) BPTSFd	60.3	%
Adjustment for no-passing zones, fnp	34.3	
Percent time-spent-following, PTSFd	79.6	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.38
Peak 15-min vehicle-miles of travel, VMT15	161 veh-mi
Peak-hour vehicle-miles of travel, VMT60	581 veh-mi
Peak 15-min total travel time, TT15	5.0 veh-h
Capacity from ATS, CdATS	1676 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1676 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.1	mi/h
Percent time-spent-following, PTSFd (from above)	79.6	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 645.6
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 6.13
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 27 (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	10 /mi

Analysis direction volume, Vd 504 veh/h
Opposing direction volume, Vo 414 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.2
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.993	0.986
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	564 pc/h	467 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 2.5 mi/h

Free-flow speed, FFSd	49.5	mi/h
Adjustment for no-passing zones, fnp	2.4	mi/h
Average travel speed, ATSD	39.1	mi/h
Percent Free Flow Speed, PFFS	78.9	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	560 pc/h	460 pc/h
Base percent time-spent-following,(note-4) BPTSFd	54.0	%
Adjustment for no-passing zones, fnp	38.1	
Percent time-spent-following, PTSFd	74.9	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.33
Peak 15-min vehicle-miles of travel, VMT15	140 veh-mi
Peak-hour vehicle-miles of travel, VMT60	504 veh-mi
Peak 15-min total travel time, TT15	3.6 veh-h
Capacity from ATS, CdATS	1676 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1676 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	39.1	mi/h
Percent time-spent-following, PTSFd (from above)	74.9	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 560.0
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.93
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 453 (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	24 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	75 %
Up/down	- %	Access point density	4 /mi

Analysis direction volume, Vd 180 veh/h
Opposing direction volume, Vo 156 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.5	1.6
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.893	0.874
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	224 pc/h	198 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.7 mi/h
Adj. for access point density,(note-3) fA 1.0 mi/h

Free-flow speed, FFSd	39.3	mi/h
Adjustment for no-passing zones, fnp	3.6	mi/h
Average travel speed, ATSD	32.4	mi/h
Percent Free Flow Speed, PFFS	82.5	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.977	0.977
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	205 pc/h	177 pc/h
Base percent time-spent-following,(note-4) BPTSFd	22.0	%
Adjustment for no-passing zones, fnp	59.3	
Percent time-spent-following, PTSFd	53.8	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.13
Peak 15-min vehicle-miles of travel, VMT15	50 veh-mi
Peak-hour vehicle-miles of travel, VMT60	180 veh-mi
Peak 15-min total travel time, TT15	1.5 veh-h
Capacity from ATS, CdATS	1486 veh/h
Capacity from PTSF, CdPTSF	1660 veh/h
Directional Capacity	1486 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.4	mi/h
Percent time-spent-following, PTSFd (from above)	53.8	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 200.0
Effective width of outside lane, We 12.50
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 14.42
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 453 (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	24 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	70 %
Up/down	- %	Access point density	16 /mi

Analysis direction volume, Vd 243 veh/h
Opposing direction volume, Vo 170 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.4	1.5
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.912	0.893
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	296 pc/h	212 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 4.0 mi/h

Free-flow speed, FFSd	36.8	mi/h
Adjustment for no-passing zones, fnp	3.4	mi/h
Average travel speed, ATSD	29.5	mi/h
Percent Free Flow Speed, PFFS	80.1	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.977	0.977
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	276 pc/h	193 pc/h
Base percent time-spent-following,(note-4) BPTSFd	28.3	%
Adjustment for no-passing zones, fnp	54.2	
Percent time-spent-following, PTSFd	60.2	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.17
Peak 15-min vehicle-miles of travel, VMT15	68 veh-mi
Peak-hour vehicle-miles of travel, VMT60	243 veh-mi
Peak 15-min total travel time, TT15	2.3 veh-h
Capacity from ATS, CdATS	1518 veh/h
Capacity from PTSF, CdPTSF	1660 veh/h
Directional Capacity	1518 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	29.5	mi/h
Percent time-spent-following, PTSFd (from above)	60.2	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 270.0
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 14.51
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS

June 2019

C.3 2043 NO BUILD



HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1991	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	67	vph
Length of first accel/decel lane	465	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	171	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1991	67	171	vph
Peak-hour factor, PHF	0.91	0.95	0.90	

Peak 15-min volume, v_{15}	547	18	48	v
Trucks and buses	24	53	36	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.791	0.847	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2450	89	224	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 2450$ pc/h

$v_{12} = 2450$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	2450	4800	No
$v_{12} = v_F - v_R$	2361	4800	No
$v_{12} = v_F$	89	2000	No
$v_{12} \text{ or } v_R$	0 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_R > 2700$ pc/h?		No	
Is $v_{12} \text{ or } v_R > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 2450$	(Equation 13-15, 13-16, 13-18, or 13-19)		
$v_{12} = 2450$			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2450	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 21.1$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.436$

S

Space mean speed in ramp influence area, $S = 57.8$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 57.8 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2095	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	169	vph
Length of first accel/decel lane	450	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	670	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2095	169	670	vph
Peak-hour factor, PHF	0.91	0.90	0.90	

Peak 15-min volume, v_{15}	576	47	186	v
Trucks and buses	24	29	16	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.873	0.926	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2578	215	804	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 2578$ pc/h

$v_{12} = 2578$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	2578	4800	No
$v_{12} = v_F - v_R$	2363	4800	No
$v_{12} = v_R$	215	2000	No
v_{12} or v_{12}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_{12} or $v_{12} > 2700$ pc/h?		No	
Is v_{12} or $v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 2578$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2578	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 22.4$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.447$

S

Space mean speed in ramp influence area, $S = 57.5$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 57.5 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2613	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	186	vph
Length of first accel/decel lane	1200	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	500	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	3500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2613	186	500	vph
Peak-hour factor, PHF	0.91	0.92	0.92	

Peak 15-min volume, v_{15}	718	51	136	v
Trucks and buses	24	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3216	212	571	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v = v + (v - v) P = 3216$ pc/h

12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$v = v$	3216	4800	No
$F_i F$			
$v = v - v$	3004	4800	No
$F_O F R$			
v	212	2000	No
R			
v or v	0 pc/h	(Equation 13-14 or 13-17)	
3 av34			
Is v or v	> 2700 pc/h?	No	
3 av34			
Is v or v	> 1.5 $v / 2$	No	
3 av34	12		
If yes, $v = 3216$	(Equation 13-15, 13-16, 13-18, or 13-19)		
12A			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v	3216	4400	No
12			

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v - 0.009 L = 21.1$ pc/mi/ln

R 12 D

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.447$

S

Space mean speed in ramp influence area, $S = 57.5$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 57.5 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2927	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	185	vph
Length of first accel/decel lane	180	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1105	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2900	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2927	185	1105	vph
Peak-hour factor, PHF	0.91	0.90	0.90	

Peak 15-min volume, v_{15}	804	51	307	v
Trucks and buses	24	29	11	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.873	0.948	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3602	235	1295	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.659$ Using Equation 5

FD

$v_{12} = v_F + (v - v_F) P = 2454$ pc/h

$v_{12} = 2454$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	3602	7200	No
$v_{12} = v_F - v_R$	3367	7200	No
$v_{12} = v_R$	235	2000	No
v_{12} or v_{12}	1148 pc/h	(Equation 13-14 or 13-17)	
Is v_{12} or $v_{12} > 2700$ pc/h?		No	
Is v_{12} or $v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 2454$	(Equation 13-15, 13-16, 13-18, or 13-19)		

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2454	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 23.7$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.449$

S

Space mean speed in ramp influence area, $S = 57.4$ mph

R

Space mean speed in outer lanes, S = 76.2 mph

0

Space mean speed for all vehicles, S = 62.3 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3743	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	404	vph
Length of first accel/decel lane	850	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	193	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	750	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3743	404	193	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v_{15}	1017	112	54	v
Trucks and buses	22	10	11	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.952	0.948	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	4516	471	226	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.625$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 3001$ pc/h

$v_{12} = 3001$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	4516	7200	No
$v_{12} = v_F - v_R$	4045	7200	No
$v_{12} = v_R$	471	2000	No
$v_{12} \text{ or } v_{12}$	1515 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_{12} > 2700$ pc/h?		No	
Is $v_{12} \text{ or } v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 3001$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3001	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 22.4$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.470$

S

Space mean speed in ramp influence area, $S = 56.8$ mph

R

Space mean speed in outer lanes, S = 74.8 mph

0

Space mean speed for all vehicles, S = 61.8 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3937	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	194	vph
Length of first accel/decel lane	150	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	404	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	920	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3937	194	404	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v_{15}	1070	54	112	v
Trucks and buses	22	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	4750	226	471	pcph

Estimation of V12 Diverge Areas

$$L = 515.27 \text{ (Equation 13-12 or 13-13)}$$

EQ

$$P = 0.631 \text{ Using Equation 5}$$

FD

$$v_{12} = v_F + (v_R - v_F) P = 3080 \text{ pc/h}$$

12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	4750	7200	No
$v_{12} = v_F - v_R$	4524	7200	No
$v_{12} = v_F$	226	2000	No
$v_{12} \text{ or } v_{12}$	1670 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_{12} > 2700 \text{ pc/h?}$		No	
Is $v_{12} \text{ or } v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 3080$	(Equation 13-15, 13-16, 13-18, or 13-19)		
12A			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3080	4400	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L = 29.4 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

$$\text{Intermediate speed variable, } D = 0.448$$

S

$$\text{Space mean speed in ramp influence area, } S = 57.4 \text{ mph}$$

R

Space mean speed in outer lanes, S = 74.2 mph

0

Space mean speed for all vehicles, S = 62.4 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3532	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	743	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane	1500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	125	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3532	743	125	vph
Peak-hour factor, PHF	0.92	0.92	0.92	

Peak 15-min volume, v_{15}	960	202	34	v
Trucks and buses	22	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	4261	848	143	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 4261$ pc/h

$v_{12} = 4261$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	4261	4800	No
$v_{12} = v_F - v_R$	3413	4800	No
$v_{12} = v_F$	848	4000	No
$v_{12} \text{ or } v_{12}$	0 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_{12} > 2700$ pc/h?		No	
Is $v_{12} \text{ or } v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 4261$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	4261	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 0.4$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable, $D = 0.504$

S

Space mean speed in ramp influence area, $S = 55.9$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 55.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2914	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	514	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	154	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2914	514	154	vph
Peak-hour factor, PHF	0.92	0.94	0.90	

Peak 15-min volume, v_{15}	792	137	43	v
Trucks and buses	22	27	16	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.881	0.926	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3516	621	185	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 3516$ pc/h

$v_{12} = 3516$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	3516	4800	No
$v_{12} = v_F - v_R$	2895	4800	No
$v_{12} = v_F$	621	2000	No
$v_{12} = v_F$ or $v_{12} = v_R$	0 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} = v_F$ or $v_{12} = v_R > 2700$ pc/h?		No	
Is $v_{12} = v_F$ or $v_{12} = v_R > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 3516$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3516	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 30.0$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable, $D = 0.484$

S

Space mean speed in ramp influence area, $S = 56.5$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 56.5 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2567	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	192	vph
Length of first accel/decel lane	475	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	66	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2567	192	66	vph
Peak-hour factor, PHF	0.92	0.90	0.92	

Peak 15-min volume, v_{15}	698	53	18	v
Trucks and buses	22	46	36	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.813	0.847	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3097	262	85	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 3097$ pc/h

$v_{12} = 3097$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	3097	4800	No
$v_{12} = v_F$			
$v_{12} = v_F - v_R$	2835	4800	No
$v_{12} = v_F - v_R$			
$v_{12} = v_F$	262	2000	No
$v_{12} = v_F$			
$v_{12} = v_F$ or $v_{12} = v_R$	0 pc/h	(Equation 13-14 or 13-17)	
$v_{12} = v_F$ or $v_{12} = v_R$			
Is $v_{12} = v_F$ or $v_{12} = v_R$ > 2700 pc/h?		No	
Is $v_{12} = v_F$ or $v_{12} = v_R$ > 1.5 $v_{12} / 2$		No	
If yes, $v_{12} = 3097$		(Equation 13-15, 13-16, 13-18, or 13-19)	
$v_{12} = 3097$			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3097	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 26.6$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.452$

S

Space mean speed in ramp influence area, $S = 57.4$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 57.4 mph

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: West of SC 453
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1991	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	547	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	1225	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.2	mi/h
Free-flow speed, FFS	72.2	mi/h

LOS and Performance Measures

Flow rate, vp	1225	pc/h/ln
Free-flow speed, FFS	72.2	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	2	
Density, D	17.5	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Between SC 453 Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1924	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	529	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	1184	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.33	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.3	mi/h
Free-flow speed, FFS	74.1	mi/h

LOS and Performance Measures

Flow rate, vp	1184	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	74.6	mi/h
Number of lanes, N	2	
Density, D	15.9	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: SC 453 to SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2095	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	576	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	1289	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	1289	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	74.1	mi/h
Number of lanes, N	2	
Density, D	17.4	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Between SC 27 Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1926	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	529	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	1185	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1185	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	74.6	mi/h
Number of lanes, N	2	
Density, D	15.9	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Between SC 27 & Volvo
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2613	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	718	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	1608	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1608	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	70.9	mi/h
Number of lanes, N	2	
Density, D	22.7	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

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Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Between Volvo Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2427	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	667	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	1494	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1494	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	72.3	mi/h
Number of lanes, N	2	
Density, D	20.7	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Volvo to Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2927	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	804	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	1801	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1801	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	67.9	mi/h
Number of lanes, N	2	
Density, D	26.5	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2742	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	753	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	1125	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.50	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.8	mi/h
Free-flow speed, FFS	73.6	mi/h

LOS and Performance Measures

Flow rate, vp	1125	pc/h/ln
Free-flow speed, FFS	73.6	mi/h
Average passenger-car speed, S	74.8	mi/h
Number of lanes, N	3	
Density, D	15.0	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Jedburg to Nexton
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3847	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	1057	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	1578	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.20	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.8	mi/h
Free-flow speed, FFS	71.6	mi/h

LOS and Performance Measures

Flow rate, vp	1578	pc/h/ln
Free-flow speed, FFS	71.6	mi/h
Average passenger-car speed, S	68.3	mi/h
Number of lanes, N	3	
Density, D	23.1	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Nexton to Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3937	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1070	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1583	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.33	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	4.1	mi/h
Free-flow speed, FFS	71.3	mi/h

LOS and Performance Measures

Flow rate, vp	1583	pc/h/ln
Free-flow speed, FFS	71.3	mi/h
Average passenger-car speed, S	68.3	mi/h
Number of lanes, N	3	
Density, D	23.2	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

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Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3339	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	907	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1343	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1343	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	73.7	mi/h
Number of lanes, N	3	
Density, D	18.2	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3743	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1017	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1505	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1505	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	72.2	mi/h
Number of lanes, N	3	
Density, D	20.9	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
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Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Jeddburg to Volvo
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3532	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	960	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	2131	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	2131	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	60.8	mi/h
Number of lanes, N	2	
Density, D	35.0+	pc/mi/ln
Level of service, LOS	E	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between Volvo Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2789	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	758	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1682	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1682	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	69.9	mi/h
Number of lanes, N	2	
Density, D	24.1	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between Volvo & SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2914	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	792	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1758	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1758	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	68.6	mi/h
Number of lanes, N	2	
Density, D	25.6	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between SC 27 Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2400	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	652	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1448	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1448	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	72.8	mi/h
Number of lanes, N	2	
Density, D	19.9	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: SC 27 to SC 453
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2567	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	698	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1549	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	1549	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	71.7	mi/h
Number of lanes, N	2	
Density, D	21.6	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between SC 453 Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2375	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	645	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1433	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.33	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.3	mi/h
Free-flow speed, FFS	74.1	mi/h

LOS and Performance Measures

Flow rate, vp	1433	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	72.9	mi/h
Number of lanes, N	2	
Density, D	19.7	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: West of SC 453
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2441	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	663	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1473	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.2	mi/h
Free-flow speed, FFS	72.2	mi/h

LOS and Performance Measures

Flow rate, vp	1473	pc/h/ln
Free-flow speed, FFS	72.2	mi/h
Average passenger-car speed, S	69.1	mi/h
Number of lanes, N	2	
Density, D	21.3	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1924	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	171	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	67	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1924	171	67	vph
Peak-hour factor, PHF	0.91	0.90	0.95	

Peak 15-min volume, v_{15}	529	48	18	v
Trucks and buses	24	36	53	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.847	0.791	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2368	224	89	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)

EQ

$P = 1.000$ Using Equation 0

FM

$v_{12} = v_{12} (P) = 2368$ pc/h

FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	2592	4800	No
FO			
v_{12} or v_{12}	0 pc/h	(Equation 13-14 or 13-17)	
$\frac{v_{12}}{3}$ av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
$\frac{v_{12}}{3}$ av34			
Is v_{12} or v_{12}	$> 1.5 \frac{v_{12}}{12}$	No	
$\frac{v_{12}}{3}$ av34			
If yes, v_{12}	$= 2368$	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2592	4600	No
R12			

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 \frac{v_{12}}{R} + 0.0078 \frac{v_{12}}{A} - 0.00627 L = 20.6$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $M = 0.317$

S

Space mean speed in ramp influence area, $S = 61.1$ mph

R

Space mean speed in outer lanes, $S = N/A$ mph

0

Space mean speed for all vehicles, $S = 61.1$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1926	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	687	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	156	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1926	687	156	vph
Peak-hour factor, PHF	0.91	0.90	0.90	

Peak 15-min volume, v_{15}	529	191	43	v
Trucks and buses	24	20	23	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.909	0.897	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2370	840	193	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)

EQ

$P = 1.000$ Using Equation 0

FM

$v_{12} = v_{12} (P) = 2370$ pc/h

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	3210	4800	No
FO			
v_{12} or v_{12}	0 pc/h	(Equation 13-14 or 13-17)	
3 av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
3 av34			
Is v_{12} or v_{12}	$> 1.5 v_{12} / 2$	No	
3 av34	12		
If yes, v_{12}	$= 2370$	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3210	4600	No
R12			

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 25.1$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $M = 0.362$

S

Space mean speed in ramp influence area, $S = 59.9$ mph

R

Space mean speed in outer lanes, $S = N/A$ mph

0

Space mean speed for all vehicles, $S = 59.9$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2427	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-flow speed on ramp	35.0	mph
Volume on ramp	500	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane	1500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	186	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	3500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2427	500	186	vph
Peak-hour factor, PHF	0.91	0.92	0.92	

Peak 15-min volume, v_{15}	667	136	51	v
Trucks and buses	24	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2987	571	212	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)

EQ

$P = 1.000$ Using Equation 0

FM

$v_{12} = v_{12} (P) = 2987$ pc/h

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	3558	4800	No
FO			
v_{12} or v_{12}	0 pc/h	(Equation 13-14 or 13-17)	
3 av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
3 av34			
Is v_{12} or v_{12}	> 1.5 $v_{12} / 2$	No	
3 av34	12		
If yes, v_{12}	= 2987	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3558	4600	No
R12			

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 4.7$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable, $M = 0.143$

S

Space mean speed in ramp influence area, $S = 66.0$ mph

R

Space mean speed in outer lanes, $S = N/A$ mph

0

Space mean speed for all vehicles, $S = 66.0$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2742	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	1105	vph
Length of first accel/decel lane	1120	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	185	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1900	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2742	1105	185	vph
Peak-hour factor, PHF	0.91	0.90	0.90	

Peak 15-min volume, v_{15}	753	307	51	v
Trucks and buses	24	11	29	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.948	0.873	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3375	1295	235	pcph

Estimation of V12 Merge Areas

$$L = 924.86 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.609 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 2055 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	4670	7200	No
FO			
v_{12} or v_{12}	1320 pc/h	(Equation 13-14 or 13-17)	
v_{12} or v_{12}			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
v_{12} or v_{12}			
Is v_{12} or v_{12}	> 1.5 v_{12} / 2	Yes	
v_{12} or v_{12}			
If yes, v_{12}	= 2055	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3350	4600	No
12A			

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 24.0 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $M = 0.354$

S

Space mean speed in ramp influence area, $S = 60.1 \text{ mph}$

R

Space mean speed in outer lanes, $S = 67.0 \text{ mph}$

0

Space mean speed for all vehicles, $S = 61.9 \text{ mph}$

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3339	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	193	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	404	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	750	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3339	193	404	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v ₁₅	907	54	112	v
Trucks and buses	22	11	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.901	0.948	0.952	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	4029	226	471	pcph

Estimation of V₁₂ Merge Areas

$$L = 1004.77 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.603 \text{ Using Equation 2}$$

FM

$$v_{12} = v_{12} (P) = 2431 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v ₁₂	4255	7200	No
FO			
v ₁₂ or v ₃₄	1598 pc/h	(Equation 13-14 or 13-17)	
Is v ₁₂ or v ₃₄ > 2700 pc/h?		No	
Is v ₁₂ or v ₃₄ > 1.5 v ₁₂ / 2		Yes	
If yes, v _{12A} = 2431		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v _{12A}	2657	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_A - 0.00627 L = 16.7 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

$$\text{Intermediate speed variable, } M = 0.272$$

S

$$\text{Space mean speed in ramp influence area, } S_R = 62.4 \text{ mph}$$

R

$$\text{Space mean speed in outer lanes, } S_O = 66.0 \text{ mph}$$

0

$$\text{Space mean speed for all vehicles, } S = 63.7 \text{ mph}$$

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2789	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	125	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	743	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2789	125	743	vph
Peak-hour factor, PHF	0.92	0.92	0.92	

Peak 15-min volume, v_{15}	758	34	202	v
Trucks and buses	22	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3365	143	848	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)

EQ

$P = 1.000$ Using Equation 0

FM

$v_{12} = v_{12} (P) = 3365$ pc/h

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	3508	4800	No
FO			
v_{12} or v_{12}	0 pc/h	(Equation 13-14 or 13-17)	
3 av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
3 av34			
Is v_{12} or v_{12}	> 1.5 $v_{12} / 2$	No	
3 av34	12		
If yes, $v_{12} = 3365$	(Equation 13-15, 13-16, 13-18, or 13-19)		
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3508	4600	No
R12			

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 23.4$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $M = 0.346$

S

Space mean speed in ramp influence area, $S = 60.3$ mph

R

Space mean speed in outer lanes, $S = N/A$ mph

0

Space mean speed for all vehicles, $S = 60.3$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2400	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	167	vph
Length of first accel/decel lane	900	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	497	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2400	167	497	vph
Peak-hour factor, PHF	0.92	0.90	0.94	

Peak 15-min volume, v_{15}	652	46	132	v
Trucks and buses	22	25	25	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.889	0.889	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2896	209	595	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)

EQ

$P = 1.000$ Using Equation 0

FM

$v_{12} = v_{12} (P) = 2896$ pc/h

FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	3105	4800	No
FO			
v_{12} or v_{12}	0 pc/h	(Equation 13-14 or 13-17)	
v_{12} or v_{12}			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
Is v_{12} or v_{12}	$> 1.5 v_{12} / 2$	No	
If yes, v_{12}	$= 2896$	(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3105	4600	No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 24.0$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $M = 0.345$

S

Space mean speed in ramp influence area, $S = 60.3$ mph

R

Space mean speed in outer lanes, $S = N/A$ mph

0

Space mean speed for all vehicles, $S = 60.3$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2375	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	66	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	192	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2375	66	192	vph
Peak-hour factor, PHF	0.92	0.92	0.90	

Peak 15-min volume, v ₁₅	645	18	53	v
Trucks and buses	22	36	46	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.901	0.847	0.813	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	2865	85	262	pcph

Estimation of V₁₂ Merge Areas

L = (Equation 13-6 or 13-7)

EQ

P = 1.000 Using Equation 0

FM

v = v₁₂ (P) = 2865 pc/h

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v	2950	4800	No
FO			
v or v ₃	0 pc/h	(Equation 13-14 or 13-17)	
av ₃₄			
Is v or v ₃	> 2700 pc/h?	No	
av ₃₄			
Is v or v ₃	> 1.5 v ₁₂ / 2	No	
av ₃₄			
If yes, v _{12A}	= 2865	(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v	2950	4600	No
R ₁₂			

Level of Service Determination (if not F)

Density, D = $5.475 + 0.00734 v_R + 0.0078 v_A - 0.00627 L$ = 23.4 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, M = 0.340

S

Space mean speed in ramp influence area, S = 60.5 mph

R

Space mean speed in outer lanes, S = N/A mph

0

Space mean speed for all vehicles, S = 60.5 mph

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Jedburg Road (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.93
Shoulder width	2.5 ft	% Trucks and buses	11 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 451 veh/h
Opposing direction volume, Vo 719 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.2	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.978	0.989
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	496 pc/h	782 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	1.3	mi/h
Average travel speed, ATSD	32.3	mi/h
Percent Free Flow Speed, PFFS	74.3	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	485 pc/h	773 pc/h
Base percent time-spent-following,(note-4) BPTSFd	53.5	%
Adjustment for no-passing zones, fnp	29.9	
Percent time-spent-following, PTSFd	65.0	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.29
Peak 15-min vehicle-miles of travel, VMT15	121 veh-mi
Peak-hour vehicle-miles of travel, VMT60	451 veh-mi
Peak 15-min total travel time, TT15	3.7 veh-h
Capacity from ATS, CdATS	1681 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1681 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.3	mi/h
Percent time-spent-following, PTSFd (from above)	65.0	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 484.9
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 7.39
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Jedburg Road (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.94
Shoulder width	2.5 ft	% Trucks and buses	11 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	60 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 994 veh/h
Opposing direction volume, Vo 683 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	1.000	0.989
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	1057 pc/h	735 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	1.0	mi/h
Average travel speed, ATSD	28.6	mi/h
Percent Free Flow Speed, PFFS	65.8	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	1057 pc/h	727 pc/h
Base percent time-spent-following,(note-4) BPTSFd	77.5	%
Adjustment for no-passing zones, fnp	19.5	
Percent time-spent-following, PTSFd	89.1	%

Level of Service and Other Performance Measures

Level of service, LOS	E
Volume to capacity ratio, v/c	0.62
Peak 15-min vehicle-miles of travel, VMT15	264 veh-mi
Peak-hour vehicle-miles of travel, VMT60	994 veh-mi
Peak 15-min total travel time, TT15	9.2 veh-h
Capacity from ATS, CdATS	1681 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1681 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	28.6	mi/h
Percent time-spent-following, PTSFd (from above)	89.1	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 1057.4
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 7.79
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Volvo Car Drive (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	6.0 ft	% Trucks and buses	10 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	20 %
Up/down	- %	Access point density	8 /mi

Analysis direction volume, Vd 928 veh/h
Opposing direction volume, Vo 625 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	1.000	0.990
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	1009 pc/h	686 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 0.0 mi/h
Adj. for access point density,(note-3) fA 2.0 mi/h

Free-flow speed, FFSd	48.0	mi/h
Adjustment for no-passing zones, fnp	0.5	mi/h
Average travel speed, ATSD	34.4	mi/h
Percent Free Flow Speed, PFFS	71.7	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	1009 pc/h	679 pc/h
Base percent time-spent-following,(note-4) BPTSFd	75.5	%
Adjustment for no-passing zones, fnp	16.3	
Percent time-spent-following, PTSFd	85.2	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.59
Peak 15-min vehicle-miles of travel, VMT15	252 veh-mi
Peak-hour vehicle-miles of travel, VMT60	928 veh-mi
Peak 15-min total travel time, TT15	7.3 veh-h
Capacity from ATS, CdATS	1683 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1683 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	34.4	mi/h
Percent time-spent-following, PTSFd (from above)	85.2	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 1008.7
Effective width of outside lane, We 24.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.45
Bicycle LOS E

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 27 (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.93
Shoulder width	1.0 ft	% Trucks and buses	16 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	30 /mi

Analysis direction volume, Vd 549 veh/h
Opposing direction volume, Vo 500 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.2
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.984	0.969
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	600 pc/h	555 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 7.5 mi/h

Free-flow speed, FFSd	43.3	mi/h
Adjustment for no-passing zones, fnp	2.0	mi/h
Average travel speed, ATSD	32.3	mi/h
Percent Free Flow Speed, PFFS	74.7	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	590 pc/h	538 pc/h
Base percent time-spent-following,(note-4) BPTSFd	57.5	%
Adjustment for no-passing zones, fnp	36.0	
Percent time-spent-following, PTSFd	76.3	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.35
Peak 15-min vehicle-miles of travel, VMT15	148 veh-mi
Peak-hour vehicle-miles of travel, VMT60	549 veh-mi
Peak 15-min total travel time, TT15	4.6 veh-h
Capacity from ATS, CdATS	1647 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1647 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.3	mi/h
Percent time-spent-following, PTSFd (from above)	76.3	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 590.3
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 10.01
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 27 (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.91
Shoulder width	2.5 ft	% Trucks and buses	16 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	10 /mi

Analysis direction volume, Vd 731 veh/h
Opposing direction volume, Vo 511 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.984	0.984
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	816 pc/h	571 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 2.5 mi/h

Free-flow speed, FFSd	49.5	mi/h
Adjustment for no-passing zones, fnp	2.0	mi/h
Average travel speed, ATSD	36.7	mi/h
Percent Free Flow Speed, PFFS	74.2	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	803 pc/h	562 pc/h
Base percent time-spent-following,(note-4) BPTSFd	67.2	%
Adjustment for no-passing zones, fnp	28.3	
Percent time-spent-following, PTSFd	83.8	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.48
Peak 15-min vehicle-miles of travel, VMT15	201 veh-mi
Peak-hour vehicle-miles of travel, VMT60	731 veh-mi
Peak 15-min total travel time, TT15	5.5 veh-h
Capacity from ATS, CdATS	1673 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1673 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	36.7	mi/h
Percent time-spent-following, PTSFd (from above)	83.8	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 803.3
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 10.03
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 453 (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	1.0 ft	% Trucks and buses	36 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	75 %
Up/down	- %	Access point density	4 /mi

Analysis direction volume, Vd 234 veh/h
Opposing direction volume, Vo 151 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.4	1.6
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.874	0.822
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	291 pc/h	200 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.7 mi/h
Adj. for access point density,(note-3) fA 1.0 mi/h

Free-flow speed, FFSd	39.3	mi/h
Adjustment for no-passing zones, fnp	3.6	mi/h
Average travel speed, ATSD	31.9	mi/h
Percent Free Flow Speed, PFFS	81.1	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.965	0.965
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	264 pc/h	170 pc/h
Base percent time-spent-following,(note-4) BPTSFd	27.2	%
Adjustment for no-passing zones, fnp	53.7	
Percent time-spent-following, PTSFd	59.9	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.17
Peak 15-min vehicle-miles of travel, VMT15	64 veh-mi
Peak-hour vehicle-miles of travel, VMT60	234 veh-mi
Peak 15-min total travel time, TT15	2.0 veh-h
Capacity from ATS, CdATS	1397 veh/h
Capacity from PTSF, CdPTSF	1641 veh/h
Directional Capacity	1397 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	31.9	mi/h
Percent time-spent-following, PTSFd (from above)	59.9	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 254.3
Effective width of outside lane, We 12.50
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 24.36
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 453 (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	36 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	70 %
Up/down	- %	Access point density	16 /mi

Analysis direction volume, Vd 227 veh/h
Opposing direction volume, Vo 190 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.4	1.5
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.874	0.847
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	289 pc/h	249 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 4.0 mi/h

Free-flow speed, FFSd	36.8	mi/h
Adjustment for no-passing zones, fnp	3.2	mi/h
Average travel speed, ATSD	29.5	mi/h
Percent Free Flow Speed, PFFS	80.1	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.965	0.965
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	261 pc/h	219 pc/h
Base percent time-spent-following,(note-4) BPTSFd	27.9	%
Adjustment for no-passing zones, fnp	56.6	
Percent time-spent-following, PTSFd	58.7	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.17
Peak 15-min vehicle-miles of travel, VMT15	63 veh-mi
Peak-hour vehicle-miles of travel, VMT60	227 veh-mi
Peak 15-min total travel time, TT15	2.1 veh-h
Capacity from ATS, CdATS	1440 veh/h
Capacity from PTSF, CdPTSF	1641 veh/h
Directional Capacity	1440 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	29.5	mi/h
Percent time-spent-following, PTSFd (from above)	58.7	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 252.2
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 24.29
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Jedburg Road (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.93
Shoulder width	2.5 ft	% Trucks and buses	11 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 719 veh/h
Opposing direction volume, Vo 451 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.2
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.989	0.978
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	782 pc/h	496 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	2.3	mi/h
Average travel speed, ATSD	31.3	mi/h
Percent Free Flow Speed, PFFS	72.0	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	773 pc/h	485 pc/h
Base percent time-spent-following,(note-4) BPTSFd	65.8	%
Adjustment for no-passing zones, fnp	29.9	
Percent time-spent-following, PTSFd	84.2	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.46
Peak 15-min vehicle-miles of travel, VMT15	193 veh-mi
Peak-hour vehicle-miles of travel, VMT60	719 veh-mi
Peak 15-min total travel time, TT15	6.2 veh-h
Capacity from ATS, CdATS	1663 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1663 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	31.3	mi/h
Percent time-spent-following, PTSFd (from above)	84.2	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 773.1
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 7.63
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Jedburg Road (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.94
Shoulder width	2.5 ft	% Trucks and buses	11 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	60 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 683 veh/h
Opposing direction volume, Vo 994 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.989	1.000
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	735 pc/h	1057 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	0.6	mi/h
Average travel speed, ATSD	29.0	mi/h
Percent Free Flow Speed, PFFS	66.7	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	727 pc/h	1057 pc/h
Base percent time-spent-following,(note-4) BPTSFd	69.0	%
Adjustment for no-passing zones, fnp	19.5	
Percent time-spent-following, PTSFd	76.9	%

Level of Service and Other Performance Measures

Level of service, LOS	E
Volume to capacity ratio, v/c	0.43
Peak 15-min vehicle-miles of travel, VMT15	182 veh-mi
Peak-hour vehicle-miles of travel, VMT60	683 veh-mi
Peak 15-min total travel time, TT15	6.3 veh-h
Capacity from ATS, CdATS	1700 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1700 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	29.0	mi/h
Percent time-spent-following, PTSFd (from above)	76.9	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 726.6
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 7.60
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Volvo Car Drive (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	6.0 ft	% Trucks and buses	10 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	20 %
Up/down	- %	Access point density	8 /mi

Analysis direction volume, Vd 625 veh/h
Opposing direction volume, Vo 928 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.990	1.000
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	686 pc/h	1009 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 0.0 mi/h
Adj. for access point density,(note-3) fA 2.0 mi/h

Free-flow speed, FFSd	48.0	mi/h
Adjustment for no-passing zones, fnp	0.4	mi/h
Average travel speed, ATSD	34.5	mi/h
Percent Free Flow Speed, PFFS	71.8	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	679 pc/h	1009 pc/h
Base percent time-spent-following,(note-4) BPTSFd	66.4	%
Adjustment for no-passing zones, fnp	16.3	
Percent time-spent-following, PTSFd	73.0	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.40
Peak 15-min vehicle-miles of travel, VMT15	170 veh-mi
Peak-hour vehicle-miles of travel, VMT60	625 veh-mi
Peak 15-min total travel time, TT15	4.9 veh-h
Capacity from ATS, CdATS	1700 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1700 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	34.5	mi/h
Percent time-spent-following, PTSFd (from above)	73.0	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 679.3
Effective width of outside lane, We 24.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.25
Bicycle LOS E

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 27 (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.93
Shoulder width	1.0 ft	% Trucks and buses	16 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	30 /mi

Analysis direction volume, Vd 500 veh/h
Opposing direction volume, Vo 549 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.2	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.969	0.984
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	555 pc/h	600 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 7.5 mi/h

Free-flow speed, FFSd	43.3	mi/h
Adjustment for no-passing zones, fnp	1.8	mi/h
Average travel speed, ATSD	32.5	mi/h
Percent Free Flow Speed, PFFS	75.1	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	538 pc/h	590 pc/h
Base percent time-spent-following,(note-4) BPTSFd	53.9	%
Adjustment for no-passing zones, fnp	36.0	
Percent time-spent-following, PTSFd	71.1	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.33
Peak 15-min vehicle-miles of travel, VMT15	134 veh-mi
Peak-hour vehicle-miles of travel, VMT60	500 veh-mi
Peak 15-min total travel time, TT15	4.1 veh-h
Capacity from ATS, CdATS	1673 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1673 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.5	mi/h
Percent time-spent-following, PTSFd (from above)	71.1	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 537.6
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 9.97
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 27 (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.91
Shoulder width	2.5 ft	% Trucks and buses	16 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	10 /mi

Analysis direction volume, Vd 511 veh/h
Opposing direction volume, Vo 731 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.984	0.984
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	571 pc/h	816 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 2.5 mi/h

Free-flow speed, FFSd	49.5	mi/h
Adjustment for no-passing zones, fnp	1.3	mi/h
Average travel speed, ATSD	37.5	mi/h
Percent Free Flow Speed, PFFS	75.7	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	562 pc/h	803 pc/h
Base percent time-spent-following,(note-4) BPTSFd	58.5	%
Adjustment for no-passing zones, fnp	28.3	
Percent time-spent-following, PTSFd	70.2	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.34
Peak 15-min vehicle-miles of travel, VMT15	140 veh-mi
Peak-hour vehicle-miles of travel, VMT60	511 veh-mi
Peak 15-min total travel time, TT15	3.7 veh-h
Capacity from ATS, CdATS	1673 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1673 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	37.5	mi/h
Percent time-spent-following, PTSFd (from above)	70.2	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 561.5
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 9.85
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 453 (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	1.0 ft	% Trucks and buses	36 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	75 %
Up/down	- %	Access point density	4 /mi

Analysis direction volume, Vd 151 veh/h
Opposing direction volume, Vo 234 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.6	1.4
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.822	0.874
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	200 pc/h	291 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.7 mi/h
Adj. for access point density,(note-3) fA 1.0 mi/h

Free-flow speed, FFSd	39.3	mi/h
Adjustment for no-passing zones, fnp	3.1	mi/h
Average travel speed, ATSD	32.4	mi/h
Percent Free Flow Speed, PFFS	82.5	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.965	0.965
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	170 pc/h	264 pc/h
Base percent time-spent-following,(note-4) BPTSFd	20.7	%
Adjustment for no-passing zones, fnp	53.7	
Percent time-spent-following, PTSFd	41.7	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.12
Peak 15-min vehicle-miles of travel, VMT15	41 veh-mi
Peak-hour vehicle-miles of travel, VMT60	151 veh-mi
Peak 15-min total travel time, TT15	1.3 veh-h
Capacity from ATS, CdATS	1486 veh/h
Capacity from PTSF, CdPTSF	1641 veh/h
Directional Capacity	1486 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.4	mi/h
Percent time-spent-following, PTSFd (from above)	41.7	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 164.1
Effective width of outside lane, We 15.56
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 23.71
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 453 (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	36 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	70 %
Up/down	- %	Access point density	16 /mi

Analysis direction volume, Vd 190 veh/h
Opposing direction volume, Vo 227 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.5	1.4
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.847	0.874
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	249 pc/h	289 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 4.0 mi/h

Free-flow speed, FFSd	36.8	mi/h
Adjustment for no-passing zones, fnp	2.9	mi/h
Average travel speed, ATSD	29.7	mi/h
Percent Free Flow Speed, PFFS	80.7	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.965	0.965
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	219 pc/h	261 pc/h
Base percent time-spent-following,(note-4) BPTSFd	24.4	%
Adjustment for no-passing zones, fnp	56.6	
Percent time-spent-following, PTSFd	50.2	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.15
Peak 15-min vehicle-miles of travel, VMT15	53 veh-mi
Peak-hour vehicle-miles of travel, VMT60	190 veh-mi
Peak 15-min total travel time, TT15	1.8 veh-h
Capacity from ATS, CdATS	1486 veh/h
Capacity from PTSF, CdPTSF	1641 veh/h
Directional Capacity	1486 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	29.7	mi/h
Percent time-spent-following, PTSFd (from above)	50.2	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 211.1
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 24.20
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2617	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	37	vph
Length of first accel/decel lane	465	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	194	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2617	37	194	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v_{15}	711	10	54	v
Trucks and buses	10	52	24	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.794	0.893	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2987	52	241	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 2987$ pc/h

$v_{12} = 2987$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	2987	4800	No
$v_{12} = v_F + (v_R - v_F) P$	2935	4800	No
$v_{12} = v_F + (v_R - v_F) P$	52	2000	No
$v_{12} = v_F + (v_R - v_F) P$	0 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} > 2700$ pc/h?		No	
Is $v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 2987$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2987	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 25.8$ pc/mi/ln

$D = 25.8$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.433$

S

Space mean speed in ramp influence area, $S = 57.9$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 57.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2774	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	191	vph
Length of first accel/decel lane	450	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	686	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2774	191	686	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v_{15}	754	53	191	v
Trucks and buses	10	14	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.935	0.966	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3166	227	789	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 3166$ pc/h

$v_{12} = 3166$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	3166	4800	No
$v_{12} = v_F - v_R$	2939	4800	No
$v_{12} = v_F + v_R$	227	2000	No
$v_{12} = v_F$ or $v_{12} = v_R$	0 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} > 2700$ pc/h?		No	
Is $v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 3166$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3166	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 27.4$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.448$

S

Space mean speed in ramp influence area, $S = 57.4$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 57.4 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3286	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	86	vph
Length of first accel/decel lane	1200	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	623	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	3500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3286	86	623	vph
Peak-hour factor, PHF	0.92	0.92	0.92	

Peak 15-min volume, v_{15}	893	23	169	v
Trucks and buses	10	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3750	98	711	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 3750$ pc/h

$v_{12} = 3750$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	3750	4800	No
$v_{12} = v_F - v_R$	3652	4800	No
$v_{12} = v_F$	98	2000	No
$v_{12} \text{ or } v_R$	0 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_R > 2700$ pc/h?		No	
Is $v_{12} \text{ or } v_R > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 3750$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3750	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 25.7$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.437$

S

Space mean speed in ramp influence area, $S = 57.8$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 57.8 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3823	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	202	vph
Length of first accel/decel lane	180	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	824	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2900	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3823	202	824	vph
Peak-hour factor, PHF	0.92	0.91	0.90	

Peak 15-min volume, v_{15}	1039	55	229	v
Trucks and buses	10	19	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.913	0.966	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	4363	243	948	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.640$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 2879$ pc/h

$v_{12} = 2879$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	4363	7200	No
$v_{12} = v_F - v_R$	4120	7200	No
$v_{12} = v_R$	243	2000	No
v_{12} or v_{12}	1484 pc/h	(Equation 13-14 or 13-17)	
Is v_{12} or $v_{12} > 2700$ pc/h?		No	
Is v_{12} or $v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 2879$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2879	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 27.4$ pc/mi/ln

$D = 27.4$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.450$

S

Space mean speed in ramp influence area, $S = 57.4$ mph

R

Space mean speed in outer lanes, S = 74.9 mph

0

Space mean speed for all vehicles, S = 62.4 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	4832	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	802	vph
Length of first accel/decel lane	850	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	198	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	750	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	4832	802	198	vph
Peak-hour factor, PHF	0.93	0.95	0.90	

Peak 15-min volume, v_{15}	1299	211	55	v
Trucks and buses	15	6	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.971	0.966	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	5585	870	228	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.580$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 3606$ pc/h

$v_{12} = 3606$

Capacity Checks

	Actual	Maximum	LOS F?
v = v Fi F	5585	7200	No
v = v - v FO F R	4715	7200	No
v R	870	2000	No
v or v 3 av34	1979 pc/h	(Equation 13-14 or 13-17)	
Is v or v 3 av34 > 2700 pc/h?		No	
Is v or v 3 av34 > 1.5 v /2		No	
If yes, v = 3606 12A		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3606	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 27.6$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.506$

S

Space mean speed in ramp influence area, $S = 55.8$ mph

R

Space mean speed in outer lanes, S = 73.0 mph

0

Space mean speed for all vehicles, S = 60.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	5187	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	355	vph
Length of first accel/decel lane	150	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	802	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	920	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	5187	355	802	vph
Peak-hour factor, PHF	0.93	0.95	0.95	

Peak 15-min volume, v_{15}	1394	93	211	v
Trucks and buses	15	6	6	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	5996	385	870	pcph

Estimation of V12 Diverge Areas

$$L = 1066.96 \text{ (Equation 13-12 or 13-13)}$$

EQ

$$P = 0.607 \text{ Using Equation 7}$$

FD

$$v_{12} = v_F + (v_R - v_F) P = 3793 \text{ pc/h}$$

12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	5996	7200	No
$v_{12} = v_F + (v_R - v_F) P$	5611	7200	No
$v_{12} = v_F + (v_R - v_F) P$	385	2000	No
$v_{12} = v_F + (v_R - v_F) P$	2203 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} > 2700 \text{ pc/h}$?		No	
Is $v_{12} > 1.5 v_F / 2$?		No	
If yes, $v_{12} = 3793$	(Equation 13-15, 13-16, 13-18, or 13-19)		
12A			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3793	4400	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L = 35.5 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence E

Speed Estimation

$$\text{Intermediate speed variable, } D = 0.463$$

S

$$\text{Space mean speed in ramp influence area, } S = 57.0 \text{ mph}$$

R

Space mean speed in outer lanes, S = 72.1 mph

0

Space mean speed for all vehicles, S = 61.8 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	4228	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	347	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane	1500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	156	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	4228	347	156	vph
Peak-hour factor, PHF	0.93	0.92	0.92	

Peak 15-min volume, v_{15}	1137	94	42	v
Trucks and buses	15	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	4887	396	178	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 4887$ pc/h

$v_{12} = 4887$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	4887	4800	Yes
$v_{12} = v_F$			
$v_{12} = v_F - v_R$	4491	4800	No
$v_{12} = v_F - v_R$			
$v_{12} = v_F$	396	4000	No
$v_{12} = v_F$			
$v_{12} = v_F$	0 pc/h	(Equation 13-14 or 13-17)	
$v_{12} = v_F$			
Is $v_{12} = v_F > 2700$ pc/h?		No	
$v_{12} = v_F$			
Is $v_{12} = v_F > 1.5 v_{12} / 2$		No	
$v_{12} = v_F$			
If yes, $v_{12} = 4887$		(Equation 13-15, 13-16, 13-18, or 13-19)	
$v_{12} = 4887$			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	4887	4400	Yes

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 5.8$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable, $D = 0.464$

S

Space mean speed in ramp influence area, $S = 57.0$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 57.0 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	4037	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	689	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	205	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	4037	689	205	vph
Peak-hour factor, PHF	0.93	0.91	0.90	

Peak 15-min volume, v_{15}	1085	189	57	v
Trucks and buses	15	10	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.952	0.966	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	4666	795	236	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 4666$ pc/h

$v_{12} = 4666$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	4666	4800	No
$v_{12} = v_F - v_R$	3871	4800	No
$v_{12} = v_F$	795	2000	No
$v_{12} \text{ or } v_{12}$	0 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_{12} > 2700$ pc/h?		No	
Is $v_{12} \text{ or } v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 4666$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	4666	4400	Yes

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 39.9$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence E

Speed Estimation

Intermediate speed variable, $D = 0.500$

S

Space mean speed in ramp influence area, $S = 56.0$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 56.0 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3556	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	198	vph
Length of first accel/decel lane	475	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	69	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3556	198	69	vph
Peak-hour factor, PHF	0.93	0.90	0.90	

Peak 15-min volume, v_{15}	956	55	19	v
Trucks and buses	15	21	24	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.905	0.893	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	4110	243	86	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 4110$ pc/h

$v_{12} = 4110$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	4110	4800	No
$v_{12} = v_F - v_R$	3867	4800	No
$v_{12} = v_F$	243	2000	No
$v_{12} \text{ or } v_{12}$	0 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_{12} > 2700$ pc/h?		No	
Is $v_{12} \text{ or } v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 4110$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	4110	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 35.3$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence E

Speed Estimation

Intermediate speed variable, $D = 0.450$

S

Space mean speed in ramp influence area, $S = 57.4$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 57.4 mph

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: West of SC 453
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2617	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	711	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1493	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.2	mi/h
Free-flow speed, FFS	72.2	mi/h

LOS and Performance Measures

Flow rate, vp	1493	pc/h/ln
Free-flow speed, FFS	72.2	mi/h
Average passenger-car speed, S	69.0	mi/h
Number of lanes, N	2	
Density, D	21.6	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Between SC 453 Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2580	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	701	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1472	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.33	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.3	mi/h
Free-flow speed, FFS	74.1	mi/h

LOS and Performance Measures

Flow rate, vp	1472	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	72.5	mi/h
Number of lanes, N	2	
Density, D	20.3	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: SC 453 to SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2774	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	754	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1583	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	1583	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	71.2	mi/h
Number of lanes, N	2	
Density, D	22.2	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
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Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Between SC 27 Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2583	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	702	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1474	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1474	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	72.5	mi/h
Number of lanes, N	2	
Density, D	20.3	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

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Phone: Fax:
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Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Between SC 27 & Volvo
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3286	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	893	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1875	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1875	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	66.5	mi/h
Number of lanes, N	2	
Density, D	28.2	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

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Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Between Volvo Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3200	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	870	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1826	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1826	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	67.4	mi/h
Number of lanes, N	2	
Density, D	27.1	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

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Phone: Fax:
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Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Volvo to Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3823	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1039	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	2182	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	2182	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	59.5	mi/h
Number of lanes, N	2	
Density, D	36.7	pc/mi/ln
Level of service, LOS	E	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
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Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3621	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	984	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1378	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.50	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.8	mi/h
Free-flow speed, FFS	73.6	mi/h

LOS and Performance Measures

Flow rate, vp	1378	pc/h/ln
Free-flow speed, FFS	73.6	mi/h
Average passenger-car speed, S	73.4	mi/h
Number of lanes, N	3	
Density, D	18.8	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

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Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Jedburg to Nexton
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	4445	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1208	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1691	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.20	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.8	mi/h
Free-flow speed, FFS	71.6	mi/h

LOS and Performance Measures

Flow rate, vp	1691	pc/h/ln
Free-flow speed, FFS	71.6	mi/h
Average passenger-car speed, S	67.2	mi/h
Number of lanes, N	3	
Density, D	25.2	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Nexton to Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	5187	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	1394	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1999	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.33	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	4.1	mi/h
Free-flow speed, FFS	71.3	mi/h

LOS and Performance Measures

Flow rate, vp	1999	pc/h/ln
Free-flow speed, FFS	71.3	mi/h
Average passenger-car speed, S	62.6	mi/h
Number of lanes, N	3	
Density, D	31.9	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

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Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	4030	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	1083	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1553	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1553	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	71.6	mi/h
Number of lanes, N	3	
Density, D	21.7	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
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Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	4832	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	1299	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1862	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1862	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	66.8	mi/h
Number of lanes, N	3	
Density, D	27.9	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

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Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Jedburg to Volvo
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	4228	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	1137	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	2444	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	2444	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	51.9	mi/h
Number of lanes, N	2	
Density, D	47.1	pc/mi/ln
Level of service, LOS	F	

Overall results are not computed when free-flow speed is less than 55 mph.

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Phone: Fax:
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Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between Volvo Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3881	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	1043	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	2243	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	2243	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	57.9	mi/h
Number of lanes, N	2	
Density, D	38.7	pc/mi/ln
Level of service, LOS	E	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

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Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between Volvo & SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	4037	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	1085	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	2333	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	2333	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	55.3	mi/h
Number of lanes, N	2	
Density, D	42.2	pc/mi/ln
Level of service, LOS	E	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between SC 27 Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3348	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	900	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1935	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1935	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	65.3	mi/h
Number of lanes, N	2	
Density, D	29.6	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: SC 27 to SC 453
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3566	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	959	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	2061	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	2061	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	62.5	mi/h
Number of lanes, N	2	
Density, D	33.0	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between SC 453 Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3368	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	905	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1947	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.33	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.3	mi/h
Free-flow speed, FFS	74.1	mi/h

LOS and Performance Measures

Flow rate, vp	1947	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	65.1	mi/h
Number of lanes, N	2	
Density, D	29.9	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: West of SC 453
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3437	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	924	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1986	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.2	mi/h
Free-flow speed, FFS	72.2	mi/h

LOS and Performance Measures

Flow rate, vp	1986	pc/h/ln
Free-flow speed, FFS	72.2	mi/h
Average passenger-car speed, S	62.8	mi/h
Number of lanes, N	2	
Density, D	31.6	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2580	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	194	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	37	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2580	194	37	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v_{15}	701	54	10	v
Trucks and buses	10	24	52	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.893	0.794	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2945	241	52	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)

EQ

$P = 1.000$ Using Equation 0

FM

$v_{12} = v_{12} (P) = 2945$ pc/h

FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	3186	4800	No
FO			
v_{12} or v_{12}	0 pc/h	(Equation 13-14 or 13-17)	
$\frac{v_{12}}{3}$ av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
$\frac{v_{12}}{3}$ av34			
Is v_{12} or v_{12}	$> 1.5 \frac{v_{12}}{12}$	No	
$\frac{v_{12}}{3}$ av34			
If yes, v_{12}	$= 2945$	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3186	4600	No
R12			

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 \frac{v_{12}}{R} + 0.0078 \frac{v_{12}}{A} - 0.00627 L = 25.2$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $M = 0.359$

S

Space mean speed in ramp influence area, $S = 59.9$ mph

R

Space mean speed in outer lanes, $S = N/A$ mph

0

Space mean speed for all vehicles, $S = 59.9$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2583	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	703	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	178	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2583	703	178	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v_{15}	702	195	49	v
Trucks and buses	10	9	8	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.957	0.962	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2948	816	206	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)

EQ

$P = 1.000$ Using Equation 0

FM

$v_{12} = v_{12} (P) = 2948$ pc/h

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	3764	4800	No
FO			
v_{12} or v_{12}	0 pc/h	(Equation 13-14 or 13-17)	
3 av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
3 av34			
Is v_{12} or v_{12}	> 1.5 $v_{12} / 2$	No	
3 av34	12		
If yes, v_{12}	= 2948	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3764	4600	No
R12			

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 29.4$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable, $M = 0.433$

S

Space mean speed in ramp influence area, $S = 57.9$ mph

R

Space mean speed in outer lanes, $S = N/A$ mph

0

Space mean speed for all vehicles, $S = 57.9$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3200	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-flow speed on ramp	35.0	mph
Volume on ramp	623	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane	1500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	86	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	3500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3200	623	86	vph
Peak-hour factor, PHF	0.92	0.92	0.92	

Peak 15-min volume, v ₁₅	870	169	23	v
Trucks and buses	10	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.952	0.952	0.952	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	3652	711	98	pcph

Estimation of V₁₂ Merge Areas

L = (Equation 13-6 or 13-7)

EQ

P = 1.000 Using Equation 0

FM

v = v₁₂ (P) = 3652 pc/h

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v	4363	4800	No
FO			
v or v ₃	0 pc/h	(Equation 13-14 or 13-17)	
av ₃₄			
Is v or v ₃	> 2700 pc/h?	No	
av ₃₄			
Is v or v ₃	> 1.5 v ₁₂ / 2	No	
av ₃₄	12		
If yes, v _{12A}	= 3652	(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v	4363	4600	No
R ₁₂			

Level of Service Determination (if not F)

Density, D = $5.475 + 0.00734 v_R + 0.0078 v_A - 0.00627 L$ = 11.0 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, M = 0.312

S

Space mean speed in ramp influence area, S = 61.3 mph

R

Space mean speed in outer lanes, S = N/A mph

0

Space mean speed for all vehicles, S = 61.3 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3621	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	824	vph
Length of first accel/decel lane	1120	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	202	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2900	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3621	824	202	vph
Peak-hour factor, PHF	0.92	0.90	0.91	

Peak 15-min volume, v_{15}	984	229	55	v
Trucks and buses	10	7	19	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.966	0.913	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	4133	948	243	pcph

Estimation of V12 Merge Areas

$$L = 1012.81 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.609 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 2516 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	5081	7200	No
FO			
v_{12} or v_{12}	1617 pc/h	(Equation 13-14 or 13-17)	
3 av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
3 av34			
Is v_{12} or v_{12}	> 1.5 $v_{12} / 2$	Yes	
3 av34	12		
If yes, v_{12}	= 2516	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	3464	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 25.0 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

$$\text{Intermediate speed variable, } M = 0.367$$

S

$$\text{Space mean speed in ramp influence area, } S = 59.7 \text{ mph}$$

R

$$\text{Space mean speed in outer lanes, } S = 66.0 \text{ mph}$$

0

$$\text{Space mean speed for all vehicles, } S = 61.6 \text{ mph}$$

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	4030	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	198	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	802	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	750	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	4030	198	802	vph
Peak-hour factor, PHF	0.93	0.90	0.95	

Peak 15-min volume, v ₁₅	1083	55	211	v
Trucks and buses	15	7	6	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.930	0.966	0.971	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	4658	228	870	pcph

Estimation of V12 Merge Areas

$$L = 1139.80 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.595 \text{ Using Equation 2}$$

FM

$$v_{12} = v_{12} (P) = 2771 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v ₁₂	4886	7200	No
FO			
v ₁₂ or v ₁₂	1887 pc/h	(Equation 13-14 or 13-17)	
3 av ₃₄			
Is v ₁₂ or v ₁₂	> 2700 pc/h?	No	
3 av ₃₄			
Is v ₁₂ or v ₁₂	> 1.5 v ₁₂ / 2	Yes	
3 av ₃₄	12		
If yes, v ₁₂	= 2771	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v _{12A}	2999	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_A - 0.00627 L = 19.4 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, M = 0.294

S

Space mean speed in ramp influence area, S = 61.8 mph

R

Space mean speed in outer lanes, S = 65.0 mph

0

Space mean speed for all vehicles, S = 63.0 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3881	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	156	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	347	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3881	156	347	vph
Peak-hour factor, PHF	0.93	0.92	0.92	

Peak 15-min volume, v_{15}	1043	42	94	v
Trucks and buses	15	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	4486	178	396	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)

EQ

$P = 1.000$ Using Equation 0

FM

$v_{12} = v_{FM} (P) = 4486$ pc/h

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4664	4800	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700$ pc/h?		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 4486$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	4664	4600	Yes

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_A - 0.00627 L = 32.4$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable, $M = 0.630$

S

Space mean speed in ramp influence area, $S_R = 52.4$ mph

R

Space mean speed in outer lanes, $S_0 = N/A$ mph

0

Space mean speed for all vehicles, $S = 52.4$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3348	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	218	vph
Length of first accel/decel lane	900	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	672	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2200	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3348	218	672	vph
Peak-hour factor, PHF	0.93	0.90	0.91	

Peak 15-min volume, v_{15}	900	61	185	v
Trucks and buses	15	13	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.939	0.966	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3870	258	764	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)

EQ

$P = 1.000$ Using Equation 0

FM

$v_{12} = v_{15} (P_{FM}) = 3870 \text{ pc/h}$

12 F FM

Capacity Checks

v_{12}	Actual 4128	Maximum 4800	LOS F? No
FO			
v_{12} or v_{15}	0 pc/h	(Equation 13-14 or 13-17)	
$\frac{v_{12}}{3}$ or $\frac{v_{15}}{3}$			
Is $\frac{v_{12}}{3}$ or $\frac{v_{15}}{3} > 2700 \text{ pc/h}$?		No	
Is $\frac{v_{12}}{3}$ or $\frac{v_{15}}{3} > 1.5 \frac{v_{12}}{12}$		No	
If yes, $v_{12} = 3870$		(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

v_{12}	Actual 4128	Max Desirable 4600	Violation? No
R12			

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 \frac{v_{12}}{R} + 0.0078 \frac{v_{15}}{A} - 0.00627 L = 31.9 \text{ pc/mi/ln}$

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable, $M = 0.500$

S

Space mean speed in ramp influence area, $S_R = 56.0 \text{ mph}$

R

Space mean speed in outer lanes, $S_0 = \text{N/A} \text{ mph}$

0

Space mean speed for all vehicles, $S = 56.0 \text{ mph}$

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3368	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	69	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	198	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3368	69	198	vph
Peak-hour factor, PHF	0.93	0.90	0.90	

Peak 15-min volume, v_{15}	905	19	55	v
Trucks and buses	15	24	21	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.893	0.905	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3893	86	243	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)

EQ

$P = 1.000$ Using Equation 0

FM

$v_{12} = v_{15} (P_{FM}) = 3893$ pc/h

12 F FM

Capacity Checks

v_{12}	Actual 3979	Maximum 4800	LOS F? No
FO			
v_{12} or v_{15}	0 pc/h	(Equation 13-14 or 13-17)	
$\frac{v_{12}}{3}$ or $\frac{v_{15}}{3}$			
Is $\frac{v_{12}}{3}$ or $\frac{v_{15}}{3} > 2700$ pc/h?		No	
Is $\frac{v_{12}}{3}$ or $\frac{v_{15}}{3} > 1.5 \frac{v_{12}}{12}$		No	
If yes, $v_{12} = 3893$		(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

v_{12}	Actual 3979	Max Desirable 4600	Violation? No
R12			

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 \frac{v_{12}}{R} + 0.0078 \frac{v_{15}}{A} - 0.00627 L = 31.5$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable, $M = 0.474$

S

Space mean speed in ramp influence area, $S_R = 56.7$ mph

R

Space mean speed in outer lanes, $S_O = N/A$ mph

O

Space mean speed for all vehicles, $S = 56.7$ mph

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Jedburg Road (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.95
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 718 veh/h
Opposing direction volume, Vo 521 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.2
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.993	0.986
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	761 pc/h	556 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	2.0	mi/h
Average travel speed, ATSD	31.3	mi/h
Percent Free Flow Speed, PFFS	71.9	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	756 pc/h	548 pc/h
Base percent time-spent-following,(note-4) BPTSFd	65.1	%
Adjustment for no-passing zones, fnp	29.9	
Percent time-spent-following, PTSFd	82.4	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.45
Peak 15-min vehicle-miles of travel, VMT15	189 veh-mi
Peak-hour vehicle-miles of travel, VMT60	718 veh-mi
Peak 15-min total travel time, TT15	6.0 veh-h
Capacity from ATS, CdATS	1676 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1676 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	31.3	mi/h
Percent time-spent-following, PTSFd (from above)	82.4	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 755.8
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 6.08
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Jedburg Road (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	60 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 877 veh/h
Opposing direction volume, Vo 1069 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	1.000	1.000
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	953 pc/h	1162 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	0.6	mi/h
Average travel speed, ATSD	26.5	mi/h
Percent Free Flow Speed, PFFS	60.9	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	953 pc/h	1162 pc/h
Base percent time-spent-following,(note-4) BPTSFd	78.4	%
Adjustment for no-passing zones, fnp	15.3	
Percent time-spent-following, PTSFd	85.3	%

Level of Service and Other Performance Measures

Level of service, LOS	E
Volume to capacity ratio, v/c	0.56
Peak 15-min vehicle-miles of travel, VMT15	238 veh-mi
Peak-hour vehicle-miles of travel, VMT60	877 veh-mi
Peak 15-min total travel time, TT15	9.0 veh-h
Capacity from ATS, CdATS	1700 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1700 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	26.5	mi/h
Percent time-spent-following, PTSFd (from above)	85.3	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 953.3
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 6.20
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Volvo Car Drive (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	6.0 ft	% Trucks and buses	10 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	20 %
Up/down	- %	Access point density	8 /mi

Analysis direction volume, Vd 433 veh/h
Opposing direction volume, Vo 779 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.2	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.980	0.990
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	480 pc/h	855 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 0.0 mi/h
Adj. for access point density,(note-3) fA 2.0 mi/h

Free-flow speed, FFSd	48.0	mi/h
Adjustment for no-passing zones, fnp	0.4	mi/h
Average travel speed, ATSD	37.3	mi/h
Percent Free Flow Speed, PFFS	77.7	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	471 pc/h	847 pc/h
Base percent time-spent-following,(note-4) BPTSFd	53.7	%
Adjustment for no-passing zones, fnp	18.3	
Percent time-spent-following, PTSFd	60.2	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.28
Peak 15-min vehicle-miles of travel, VMT15	118 veh-mi
Peak-hour vehicle-miles of travel, VMT60	433 veh-mi
Peak 15-min total travel time, TT15	3.2 veh-h
Capacity from ATS, CdATS	1683 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1683 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	37.3	mi/h
Percent time-spent-following, PTSFd (from above)	60.2	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 470.7
Effective width of outside lane, We 24.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.06
Bicycle LOS E

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 27 (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	7 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	30 /mi

Analysis direction volume, Vd 597 veh/h
Opposing direction volume, Vo 769 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.993	1.000
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	668 pc/h	854 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 7.5 mi/h

Free-flow speed, FFSd	43.3	mi/h
Adjustment for no-passing zones, fnp	1.2	mi/h
Average travel speed, ATSD	30.3	mi/h
Percent Free Flow Speed, PFFS	70.0	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	663 pc/h	854 pc/h
Base percent time-spent-following,(note-4) BPTSFd	64.1	%
Adjustment for no-passing zones, fnp	25.8	
Percent time-spent-following, PTSFd	75.4	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.39
Peak 15-min vehicle-miles of travel, VMT15	166 veh-mi
Peak-hour vehicle-miles of travel, VMT60	597 veh-mi
Peak 15-min total travel time, TT15	5.5 veh-h
Capacity from ATS, CdATS	1700 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1700 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	30.3	mi/h
Percent time-spent-following, PTSFd (from above)	75.4	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 663.3
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 6.15
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 27 (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	10 /mi

Analysis direction volume, Vd 572 veh/h
Opposing direction volume, Vo 704 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.993	0.993
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	640 pc/h	788 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 2.5 mi/h

Free-flow speed, FFSd	49.5	mi/h
Adjustment for no-passing zones, fnp	1.3	mi/h
Average travel speed, ATSD	37.1	mi/h
Percent Free Flow Speed, PFFS	74.9	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	636 pc/h	782 pc/h
Base percent time-spent-following,(note-4) BPTSFd	62.1	%
Adjustment for no-passing zones, fnp	27.6	
Percent time-spent-following, PTSFd	74.5	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.38
Peak 15-min vehicle-miles of travel, VMT15	159 veh-mi
Peak-hour vehicle-miles of travel, VMT60	572 veh-mi
Peak 15-min total travel time, TT15	4.3 veh-h
Capacity from ATS, CdATS	1688 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1688 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	37.1	mi/h
Percent time-spent-following, PTSFd (from above)	74.5	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 635.6
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.99
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 453 (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	24 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	75 %
Up/down	- %	Access point density	4 /mi

Analysis direction volume, Vd 186 veh/h
Opposing direction volume, Vo 214 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.5	1.5
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.893	0.893
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	231 pc/h	266 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.7 mi/h
Adj. for access point density,(note-3) fA 1.0 mi/h

Free-flow speed, FFSd	39.3	mi/h
Adjustment for no-passing zones, fnp	3.2	mi/h
Average travel speed, ATSD	32.2	mi/h
Percent Free Flow Speed, PFFS	82.0	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.977	0.977
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	212 pc/h	243 pc/h
Base percent time-spent-following,(note-4) BPTSFd	24.2	%
Adjustment for no-passing zones, fnp	58.5	
Percent time-spent-following, PTSFd	51.5	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.14
Peak 15-min vehicle-miles of travel, VMT15	52 veh-mi
Peak-hour vehicle-miles of travel, VMT60	186 veh-mi
Peak 15-min total travel time, TT15	1.6 veh-h
Capacity from ATS, CdATS	1518 veh/h
Capacity from PTSF, CdPTSF	1660 veh/h
Directional Capacity	1518 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.2	mi/h
Percent time-spent-following, PTSFd (from above)	51.5	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 206.7
Effective width of outside lane, We 12.50
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 14.44
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 453 (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	24 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	70 %
Up/down	- %	Access point density	16 /mi

Analysis direction volume, Vd 202 veh/h
Opposing direction volume, Vo 288 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.5	1.4
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.893	0.912
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	251 pc/h	351 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 4.0 mi/h

Free-flow speed, FFSd	36.8	mi/h
Adjustment for no-passing zones, fnp	2.5	mi/h
Average travel speed, ATSD	29.6	mi/h
Percent Free Flow Speed, PFFS	80.4	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.977	0.977
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	230 pc/h	328 pc/h
Base percent time-spent-following,(note-4) BPTSFd	27.2	%
Adjustment for no-passing zones, fnp	52.9	
Percent time-spent-following, PTSFd	49.0	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.15
Peak 15-min vehicle-miles of travel, VMT15	56 veh-mi
Peak-hour vehicle-miles of travel, VMT60	202 veh-mi
Peak 15-min total travel time, TT15	1.9 veh-h
Capacity from ATS, CdATS	1550 veh/h
Capacity from PTSF, CdPTSF	1660 veh/h
Directional Capacity	1550 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	29.6	mi/h
Percent time-spent-following, PTSFd (from above)	49.0	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 224.4
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 14.42
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Jedburg Road (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.95
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 521 veh/h
Opposing direction volume, Vo 718 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.2	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.986	0.993
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	556 pc/h	761 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	1.3	mi/h
Average travel speed, ATSD	32.0	mi/h
Percent Free Flow Speed, PFFS	73.5	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	548 pc/h	756 pc/h
Base percent time-spent-following,(note-4) BPTSFd	57.0	%
Adjustment for no-passing zones, fnp	29.9	
Percent time-spent-following, PTSFd	69.6	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.33
Peak 15-min vehicle-miles of travel, VMT15	137 veh-mi
Peak-hour vehicle-miles of travel, VMT60	521 veh-mi
Peak 15-min total travel time, TT15	4.3 veh-h
Capacity from ATS, CdATS	1688 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1688 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.0	mi/h
Percent time-spent-following, PTSFd (from above)	69.6	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 548.4
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.92
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Jedburg Road (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	60 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 1069 veh/h
Opposing direction volume, Vo 877 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	1.000	1.000
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	1162 pc/h	953 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	0.6	mi/h
Average travel speed, ATSD	26.4	mi/h
Percent Free Flow Speed, PFFS	60.8	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	1162 pc/h	953 pc/h
Base percent time-spent-following,(note-4) BPTSFd	81.4	%
Adjustment for no-passing zones, fnp	15.3	
Percent time-spent-following, PTSFd	89.8	%

Level of Service and Other Performance Measures

Level of service, LOS	E
Volume to capacity ratio, v/c	0.68
Peak 15-min vehicle-miles of travel, VMT15	290 veh-mi
Peak-hour vehicle-miles of travel, VMT60	1069 veh-mi
Peak 15-min total travel time, TT15	11.0 veh-h
Capacity from ATS, CdATS	1700 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1700 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	26.4	mi/h
Percent time-spent-following, PTSFd (from above)	89.8	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 1162.0
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 6.30
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Volvo Car Drive (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	6.0 ft	% Trucks and buses	10 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	20 %
Up/down	- %	Access point density	8 /mi

Analysis direction volume, Vd 779 veh/h
Opposing direction volume, Vo 433 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.2
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.990	0.980
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	855 pc/h	480 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 0.0 mi/h
Adj. for access point density,(note-3) fA 2.0 mi/h

Free-flow speed, FFSd	48.0	mi/h
Adjustment for no-passing zones, fnp	0.8	mi/h
Average travel speed, ATSD	36.8	mi/h
Percent Free Flow Speed, PFFS	76.7	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	847 pc/h	471 pc/h
Base percent time-spent-following,(note-4) BPTSFd	68.4	%
Adjustment for no-passing zones, fnp	18.3	
Percent time-spent-following, PTSFd	80.2	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.50
Peak 15-min vehicle-miles of travel, VMT15	212 veh-mi
Peak-hour vehicle-miles of travel, VMT60	779 veh-mi
Peak 15-min total travel time, TT15	5.8 veh-h
Capacity from ATS, CdATS	1666 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1666 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	36.8	mi/h
Percent time-spent-following, PTSFd (from above)	80.2	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 846.7
Effective width of outside lane, We 24.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.36
Bicycle LOS E

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 27 (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	7 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	30 /mi

Analysis direction volume, Vd 769 veh/h
Opposing direction volume, Vo 597 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	1.000	0.993
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	854 pc/h	668 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 7.5 mi/h

Free-flow speed, FFSd	43.3	mi/h
Adjustment for no-passing zones, fnp	1.6	mi/h
Average travel speed, ATSD	29.9	mi/h
Percent Free Flow Speed, PFFS	69.0	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	854 pc/h	663 pc/h
Base percent time-spent-following,(note-4) BPTSFd	70.2	%
Adjustment for no-passing zones, fnp	25.8	
Percent time-spent-following, PTSFd	84.7	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.50
Peak 15-min vehicle-miles of travel, VMT15	214 veh-mi
Peak-hour vehicle-miles of travel, VMT60	769 veh-mi
Peak 15-min total travel time, TT15	7.2 veh-h
Capacity from ATS, CdATS	1688 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1688 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	29.9	mi/h
Percent time-spent-following, PTSFd (from above)	84.7	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 854.4
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 6.27
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 27 (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	10 /mi

Analysis direction volume, Vd 704 veh/h
Opposing direction volume, Vo 572 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.993	0.993
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	788 pc/h	640 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 2.5 mi/h

Free-flow speed, FFSd	49.5	mi/h
Adjustment for no-passing zones, fnp	1.8	mi/h
Average travel speed, ATSD	36.6	mi/h
Percent Free Flow Speed, PFFS	74.0	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	782 pc/h	636 pc/h
Base percent time-spent-following,(note-4) BPTSFd	66.7	%
Adjustment for no-passing zones, fnp	27.6	
Percent time-spent-following, PTSFd	81.9	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.46
Peak 15-min vehicle-miles of travel, VMT15	196 veh-mi
Peak-hour vehicle-miles of travel, VMT60	704 veh-mi
Peak 15-min total travel time, TT15	5.3 veh-h
Capacity from ATS, CdATS	1688 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1688 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	36.6	mi/h
Percent time-spent-following, PTSFd (from above)	81.9	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 782.2
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 6.10
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 453 (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	24 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	75 %
Up/down	- %	Access point density	4 /mi

Analysis direction volume, Vd 214 veh/h
Opposing direction volume, Vo 186 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.5	1.5
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.893	0.893
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	266 pc/h	231 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.7 mi/h
Adj. for access point density,(note-3) fA 1.0 mi/h

Free-flow speed, FFSd	39.3	mi/h
Adjustment for no-passing zones, fnp	3.4	mi/h
Average travel speed, ATSD	32.0	mi/h
Percent Free Flow Speed, PFFS	81.5	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.977	0.977
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	243 pc/h	212 pc/h
Base percent time-spent-following,(note-4) BPTSFd	25.1	%
Adjustment for no-passing zones, fnp	58.5	
Percent time-spent-following, PTSFd	56.3	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.16
Peak 15-min vehicle-miles of travel, VMT15	59 veh-mi
Peak-hour vehicle-miles of travel, VMT60	214 veh-mi
Peak 15-min total travel time, TT15	1.8 veh-h
Capacity from ATS, CdATS	1518 veh/h
Capacity from PTSF, CdPTSF	1660 veh/h
Directional Capacity	1518 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.0	mi/h
Percent time-spent-following, PTSFd (from above)	56.3	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 237.8
Effective width of outside lane, We 12.50
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 14.51
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 453 (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	24 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	70 %
Up/down	- %	Access point density	16 /mi

Analysis direction volume, Vd 288 veh/h
Opposing direction volume, Vo 202 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.4	1.5
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.912	0.893
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	351 pc/h	251 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 4.0 mi/h

Free-flow speed, FFSd 36.8 mi/h

Adjustment for no-passing zones, fnp 3.1 mi/h

Average travel speed, ATSD 29.0 mi/h

Percent Free Flow Speed, PFFS 78.8 %

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.977	0.977
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	328 pc/h	230 pc/h
Base percent time-spent-following,(note-4) BPTSFd	33.1 %	
Adjustment for no-passing zones, fnp	52.9	
Percent time-spent-following, PTSFd	64.2 %	

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.21
Peak 15-min vehicle-miles of travel, VMT15	80 veh-mi
Peak-hour vehicle-miles of travel, VMT60	288 veh-mi
Peak 15-min total travel time, TT15	2.8 veh-h
Capacity from ATS, CdATS	1518 veh/h
Capacity from PTSF, CdPTSF	1660 veh/h
Directional Capacity	1518 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0 mi
Length of two-lane highway upstream of the passing lane, Lu	- mi
Length of passing lane including tapers, Lpl	- mi
Average travel speed, ATSD (from above)	29.0 mi/h
Percent time-spent-following, PTSFd (from above)	64.2
Level of service, LOSd (from above)	C

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	- mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	- mi
Adj. factor for the effect of passing lane on average speed, fpl	-
Average travel speed including passing lane, ATSpl	-
Percent free flow speed including passing lane, PFFSpl	0.0 %

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 320.0
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 14.60
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

June 2019

C.4 2023 BUILD – ALTERNATIVE 1



HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1525	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	55	vph
Length of first accel/decel lane	465	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	142	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1525	55	142	vph
Peak-hour factor, PHF	0.91	0.95	0.90	

Peak 15-min volume, v_{15}	419	14	39	v
Trucks and buses	24	53	36	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.791	0.847	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	1877	73	186	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 1877$ pc/h

$v_{12} = 1877$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	1877	4800	No
$v_{12} = v_F$			
$v_{12} = v_F - v_R$	1804	4800	No
$v_{12} = v_F - v_R$			
$v_{12} = v_F$	73	2000	No
$v_{12} = v_F$			
$v_{12} = v_F$ or $v_{12} = v_R$	0 pc/h	(Equation 13-14 or 13-17)	
$v_{12} = v_F$ or $v_{12} = v_R$			
Is $v_{12} = v_F$ or $v_{12} = v_R$ > 2700 pc/h?		No	
Is $v_{12} = v_F$ or $v_{12} = v_R$ > 1.5 $v_{12} / 2$		No	
If yes, $v_{12} = 1877$		(Equation 13-15, 13-16, 13-18, or 13-19)	
$v_{12} = 1877$			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1877	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 16.2$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.435$

S

Space mean speed in ramp influence area, $S = 57.8$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 57.8 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1612	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	119	vph
Length of first accel/decel lane	250	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	507	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	4000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1612	119	507	vph
Peak-hour factor, PHF	0.91	0.90	0.90	

Peak 15-min volume, v_{15}	443	33	141	v
Trucks and buses	24	23	16	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.897	0.926	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	1984	147	608	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.704$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 1440$ pc/h

$v_{12} = 1440$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	1984	7200	No
$v_{12} = v_F$			
$v_{12} = v_F - v_R$	1837	7200	No
$v_{12} = v_F - v_R$			
$v_{12} = v_R$	147	2000	No
$v_{12} = v_R$			
$v_{12} = v_F$ or $v_{12} = v_R$	544 pc/h	(Equation 13-14 or 13-17)	
$v_{12} = v_F$ or $v_{12} = v_R$			
Is $v_{12} = v_F$ or $v_{12} = v_R$ > 2700 pc/h?		No	
Is $v_{12} = v_F$ or $v_{12} = v_R$ > 1.5 $v_{12} / 2$		No	
If yes, $v_{12} = 1440$	(Equation 13-15, 13-16, 13-18, or 13-19)		
$v_{12} = 1440$			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1440	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 14.4$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.441$

S

Space mean speed in ramp influence area, $S = 57.6$ mph

R

Space mean speed in outer lanes, S = 76.8 mph

0

Space mean speed for all vehicles, S = 61.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2000	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	98	vph
Length of first accel/decel lane	1200	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	89	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	3500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2000	98	89	vph
Peak-hour factor, PHF	0.91	0.92	0.92	

Peak 15-min volume, v_{15}	549	27	24	v
Trucks and buses	24	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2462	112	102	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.693$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 1741$ pc/h

$v_{12} = 1741$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	2462	7200	No
$v_{12} = v_F - v_R$	2350	7200	No
$v_{12} = v_R$	112	2000	No
v_{12} or v_{12}	721 pc/h	(Equation 13-14 or 13-17)	
Is v_{12} or $v_{12} > 2700$ pc/h?		No	
Is v_{12} or $v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 1741$	(Equation 13-15, 13-16, 13-18, or 13-19)		
$v_{12} = 1741$			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1741	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 8.4$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable, $D = 0.438$

S

Space mean speed in ramp influence area, $S = 57.7$ mph

R

Space mean speed in outer lanes, S = 76.8 mph

0

Space mean speed for all vehicles, S = 62.3 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1991	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	145	vph
Length of first accel/decel lane	180	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	864	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2900	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1991	145	864	vph
Peak-hour factor, PHF	0.91	0.90	0.90	

Peak 15-min volume, v_{15}	547	40	240	v
Trucks and buses	24	29	11	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.873	0.948	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2450	184	1013	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.690$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 1748$ pc/h

$v_{12} = 1748$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	2450	7200	No
$v_{12} = v_F + (v_R - v_F) P$	2266	7200	No
$v_{12} = v_R$	184	2000	No
$v_{12} = v_F$ or $v_{12} = v_R$	702 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} > 2700$ pc/h?		No	
Is $v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 1748$	(Equation 13-15, 13-16, 13-18, or 13-19)		
$v_{12} = 1748$			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1748	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 17.7$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.445$

S

Space mean speed in ramp influence area, $S = 57.6$ mph

R

Space mean speed in outer lanes, S = 76.8 mph

0

Space mean speed for all vehicles, S = 62.0 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2750	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	316	vph
Length of first accel/decel lane	850	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	151	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	750	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2750	316	151	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v_{15}	747	88	42	v
Trucks and buses	22	10	11	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.952	0.948	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3318	369	177	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.660$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 2316$ pc/h

v_{12} R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
v = v Fi F	3318	7200	No
v = v - v FO F R	2949	7200	No
v R	369	2000	No
v or v 3 av34	1002 pc/h	(Equation 13-14 or 13-17)	
Is v or v 3 av34 > 2700 pc/h?		No	
Is v or v 3 av34 > 1.5 v /2		No	
If yes, v = 2316 12A		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2316	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 16.5$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.461$

S

Space mean speed in ramp influence area, $S = 57.1$ mph

R

Space mean speed in outer lanes, S = 76.8 mph

0

Space mean speed for all vehicles, S = 61.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2902	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	152	vph
Length of first accel/decel lane	150	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	316	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	920	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2902	152	316	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v_{15}	789	42	88	v
Trucks and buses	22	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3501	177	369	pcph

Estimation of V12 Diverge Areas

$$L = 379.52 \text{ (Equation 13-12 or 13-13)}$$

EQ

$$P = 0.664 \text{ Using Equation 5}$$

FD

$$v_{12} = v_F + (v_R - v_F) P = 2385 \text{ pc/h}$$

$$v_{12} = 2385$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	3501	7200	No
$v_{12} = v_F - v_R$	3324	7200	No
$v_{12} = v_F$	177	2000	No
$v_{12} \text{ or } v_{12}$	1116 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_{12} > 2700 \text{ pc/h?}$		No	
Is $v_{12} \text{ or } v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 2385$	(Equation 13-15, 13-16, 13-18, or 13-19)		

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2385	4400	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L = 23.4 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

$$\text{Intermediate speed variable, } D = 0.444$$

S

$$\text{Space mean speed in ramp influence area, } S = 57.6 \text{ mph}$$

R

Space mean speed in outer lanes, S = 76.3 mph

0

Space mean speed for all vehicles, S = 62.5 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2585	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	394	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane	1500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	23	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2585	394	23	vph
Peak-hour factor, PHF	0.92	0.92	0.92	

Peak 15-min volume, v ₁₅	702	107	6	v
Trucks and buses	22	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.901	0.952	0.952	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	3119	450	26	pcph

Estimation of V12 Diverge Areas

L = (Equation 13-12 or 13-13)

EQ

P = 0.450 Using Equation 0

FD

$v_{12R} = v_F + (v - v_F) P = 1651$ pc/h

12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12R} = v_F$	3119	7200	No
$v_{12R} = v_F - v_{12R}$	2669	7200	No
v_{12R}	450	4000	No
v_{12R} or v_{12R}	1468 pc/h	(Equation 13-14 or 13-17)	
Is v_{12R} or $v_{12R} > 2700$ pc/h?		No	
Is v_{12R} or $v_{12R} > 1.5 v_{12R} / 2$		Yes	
If yes, $v_{12A} = 1782$	(Equation 13-15, 13-16, 13-18, or 13-19)		

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	1782	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12R} - 0.009 L = -20.9$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable, $D = 0.469$

S

Space mean speed in ramp influence area, $S = 56.9$ mph

R

Space mean speed in outer lanes, S = 75.5 mph

0

Space mean speed for all vehicles, S = 63.6 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2214	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	376	vph
Length of first accel/decel lane	250	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	117	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	3300	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2214	376	117	vph
Peak-hour factor, PHF	0.92	0.94	0.90	

Peak 15-min volume, v_{15}	602	100	33	v
Trucks and buses	22	25	16	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.889	0.926	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2671	450	140	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.673$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 1944$ pc/h

$v_{12} = 1944$

Capacity Checks

	Actual	Maximum	LOS F?
v = v Fi F	2671	7200	No
v = v - v FO F R	2221	7200	No
v R	450	2000	No
v or v 3 av34	727 pc/h	(Equation 13-14 or 13-17)	
Is v or v 3 av34	> 2700 pc/h?	No	
Is v or v 3 av34	> 1.5 v /2	No	
If yes, v = 1944 12A	(Equation 13-15, 13-16, 13-18, or 13-19)		

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1944	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 18.7$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.469$

S

Space mean speed in ramp influence area, $S = 56.9$ mph

R

Space mean speed in outer lanes, S = 76.8 mph

0

Space mean speed for all vehicles, S = 61.2 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1955	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	161	vph
Length of first accel/decel lane	475	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	54	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1955	161	54	vph
Peak-hour factor, PHF	0.92	0.90	0.92	

Peak 15-min volume, v_{15}	531	45	15	v
Trucks and buses	22	46	36	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.813	0.847	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2359	220	69	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 2359$ pc/h

$v_{12} = 2359$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	2359	4800	No
$v_{12} = v_F - v_R$	2139	4800	No
$v_{12} = v_R$	220	2000	No
$v_{12} \text{ or } v_{12}$	0 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_{12} > 2700$ pc/h?		No	
Is $v_{12} \text{ or } v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 2359$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2359	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 20.3$ pc/mi/ln

$D = 20.3$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.448$

S

Space mean speed in ramp influence area, $S = 57.5$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 57.5 mph

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: West of SC 453
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1525	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	419	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	938	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.2	mi/h
Free-flow speed, FFS	72.2	mi/h

LOS and Performance Measures

Flow rate, vp	938	pc/h/ln
Free-flow speed, FFS	72.2	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	2	
Density, D	13.4	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Between SC 453 Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1470	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	404	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	905	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.33	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.3	mi/h
Free-flow speed, FFS	74.1	mi/h

LOS and Performance Measures

Flow rate, vp	905	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	2	
Density, D	12.1	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: SC 453 to SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1612	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	443	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	992	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	992	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	2	
Density, D	13.2	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Between SC 27 Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1493	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	410	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	613	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	613	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	8.2	pc/mi/ln
Level of service, LOS	A	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Between SC 27 & Volvo
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2000	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	549	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	821	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, v_p	821	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	10.9	pc/mi/ln
Level of service, LOS	A	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Between Volvo Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1902	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	523	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	780	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	780	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	10.4	pc/mi/ln
Level of service, LOS	A	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Volvo to Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1991	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	547	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	817	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	817	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	10.9	pc/mi/ln
Level of service, LOS	A	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1846	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	507	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	757	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.50	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.8	mi/h
Free-flow speed, FFS	73.6	mi/h

LOS and Performance Measures

Flow rate, vp	757	pc/h/ln
Free-flow speed, FFS	73.6	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	10.1	pc/mi/ln
Level of service, LOS	A	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Jedburg to Nexton
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2710	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	745	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	1112	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.20	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.8	mi/h
Free-flow speed, FFS	71.6	mi/h

LOS and Performance Measures

Flow rate, vp	1112	pc/h/ln
Free-flow speed, FFS	71.6	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	3	
Density, D	15.9	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Nexton to Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2902	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	789	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1167	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.33	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	4.1	mi/h
Free-flow speed, FFS	71.3	mi/h

LOS and Performance Measures

Flow rate, vp	1167	pc/h/ln
Free-flow speed, FFS	71.3	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	3	
Density, D	16.7	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2434	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	661	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	979	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	979	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	13.1	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
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Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2750	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	747	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1106	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1106	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	74.9	mi/h
Number of lanes, N	3	
Density, D	14.8	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
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Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Jeddburg to Volvo
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2585	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	702	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1040	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	1040	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	13.9	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
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Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between Volvo Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2191	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	595	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	881	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	881	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	11.7	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between Volvo & SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2214	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	602	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	890	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	890	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	11.9	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between SC 27 Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1838	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	499	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	739	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	739	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	9.9	pc/mi/ln
Level of service, LOS	A	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: SC 27 to SC 453
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1955	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	531	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1179	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	1179	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	74.6	mi/h
Number of lanes, N	2	
Density, D	15.8	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between SC 453 Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1794	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	487	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1082	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.33	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.3	mi/h
Free-flow speed, FFS	74.1	mi/h

LOS and Performance Measures

Flow rate, vp	1082	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	74.9	mi/h
Number of lanes, N	2	
Density, D	14.4	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: West of SC 453
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1898	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	516	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1145	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.2	mi/h
Free-flow speed, FFS	72.2	mi/h

LOS and Performance Measures

Flow rate, vp	1145	pc/h/ln
Free-flow speed, FFS	72.2	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	2	
Density, D	16.4	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1470	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	142	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	55	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1470	142	55	vph
Peak-hour factor, PHF	0.91	0.90	0.95	

Peak 15-min volume, v_{15}	404	39	14	v
Trucks and buses	24	36	53	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.847	0.791	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	1809	186	73	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)

EQ

$P = 1.000$ Using Equation 0

FM

$v_{12} = v_{15} (P_{FM}) = 1809 \text{ pc/h}$

12 F FM

Capacity Checks

v_{12} Actual 1995 Maximum 4800 LOS F? No

FO

v_{12} or v_{15} 0 pc/h (Equation 13-14 or 13-17)

3 av34

Is v_{12} or $v_{15} > 2700 \text{ pc/h}$? No

3 av34

Is v_{12} or $v_{15} > 1.5 v_{12} / 2$ No

3 av34 12

If yes, $v_{12} = 1809$ (Equation 13-15, 13-16, 13-18, or 13-19)

12A

Flow Entering Merge Influence Area

v_{12} Actual 1995 Max Desirable 4600 Violation? No

R12

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_{12} + 0.0078 v_{15} - 0.00627 L = 15.9 \text{ pc/mi/ln}$

R R 12 A

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.294$

S

Space mean speed in ramp influence area, $S = 61.8 \text{ mph}$

R

Space mean speed in outer lanes, $S = \text{N/A} \text{ mph}$

0

Space mean speed for all vehicles, $S = 61.8 \text{ mph}$

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1493	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	507	vph
Length of first accel/decel lane	900	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	119	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	4000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1493	507	119	vph
Peak-hour factor, PHF	0.91	0.90	0.90	

Peak 15-min volume, v_{15}	410	141	33	v
Trucks and buses	24	16	23	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.926	0.897	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	1838	608	147	pcph

Estimation of V12 Merge Areas

$$L = 351.24 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.603 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 1108 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	2446	7200	No
FO			
v_{12} or v_{12}	730 pc/h	(Equation 13-14 or 13-17)	
$\frac{v_{12}}{3}$ av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
$\frac{v_{12}}{3}$ av34			
Is v_{12} or v_{12}	> 1.5 $v_{12} / 2$	Yes	
$\frac{v_{12}}{3}$ av34	12		
If yes, v_{12}	= 1108	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1716	4600	No
12A			

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 12.9 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.280$

S

Space mean speed in ramp influence area, $S = 62.2$ mph

R

Space mean speed in outer lanes, $S = 69.2$ mph

0

Space mean speed for all vehicles, $S = 64.1$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1902	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-flow speed on ramp	35.0	mph
Volume on ramp	89	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane	1500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	98	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	3500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
	Ramp			
Volume, V (vph)	1902	89	98	vph
Peak-hour factor, PHF	0.91	0.92	0.92	

Peak 15-min volume, v ₁₅	523	24	27	v
Trucks and buses	24	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.893	0.952	0.952	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	2341	102	112	pcph

Estimation of V₁₂ Merge Areas

L = (Equation 13-6 or 13-7)

EQ

P = 0.555 Using Equation 0

FM

v = v_P = 1299 pc/h

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v	2443	7200	No
FO			
v or v ₃	1042 pc/h	(Equation 13-14 or 13-17)	
av ₃₄			
Is v or v ₃	> 2700 pc/h?	No	
av ₃₄			
Is v or v ₃	> 1.5 v / 2	Yes	
av ₃₄	12		
If yes, v _{12A}	(Equation 13-15, 13-16, 13-18, or 13-19)		

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v	1439	4600	No
12A			

Level of Service Determination (if not F)

Density, D = $5.475 + 0.00734 v_R + 0.0078 v_A - 0.00627 L$ = -11.6 pc/mi/ln

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable, M = 0.022

S

Space mean speed in ramp influence area, S = 69.4 mph

R

Space mean speed in outer lanes, S = 68.2 mph

0

Space mean speed for all vehicles, S = 68.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1846	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	864	vph
Length of first accel/decel lane	1120	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	145	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2900	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1846	864	145	vph
Peak-hour factor, PHF	0.91	0.90	0.90	

Peak 15-min volume, v ₁₅	507	240	40	v
Trucks and buses	24	11	29	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.893	0.948	0.873	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	2272	1013	184	pcph

Estimation of V₁₂ Merge Areas

$$L = 628.47 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.609 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 1383 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v	3285	7200	No
FO			
v or v ₃	889 pc/h	(Equation 13-14 or 13-17)	
av ₃₄			
Is v or v ₃	> 2700 pc/h?	No	
av ₃₄			
Is v or v ₃	> 1.5 v ₁₂ / 2	Yes	
av ₃₄	12		
If yes, v _{12A}	= 1383	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v	2396	4600	No
12A			

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_A - 0.00627 L = 16.7 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

$$\text{Intermediate speed variable, } M = 0.285$$

S

$$\text{Space mean speed in ramp influence area, } S_R = 62.0 \text{ mph}$$

R

$$\text{Space mean speed in outer lanes, } S_0 = 68.6 \text{ mph}$$

0

$$\text{Space mean speed for all vehicles, } S = 63.7 \text{ mph}$$

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2191	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	23	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	394	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
	Ramp			
Volume, V (vph)	2191	23	394	vph
Peak-hour factor, PHF	0.92	0.92	0.92	

Peak 15-min volume, v_{15}	595	6	107	v
Trucks and buses	22	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2643	26	450	pcph

Estimation of V12 Merge Areas

$$L = 665.37 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.619 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 1637 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	2669	7200	No
FO			
v_{12} or v_{12}	1006 pc/h	(Equation 13-14 or 13-17)	
v_{12} or v_{12}			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
v_{12} or v_{12}			
Is v_{12} or v_{12}	> 1.5 v_{12} / 2	Yes	
v_{12} or v_{12}			
If yes, v_{12}	= 1637	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1663	4600	No
12A			

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 9.0 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

$$\text{Intermediate speed variable, } M = 0.237$$

S

$$\text{Space mean speed in ramp influence area, } S = 63.4 \text{ mph}$$

R

$$\text{Space mean speed in outer lanes, } S = 68.2 \text{ mph}$$

0

$$\text{Space mean speed for all vehicles, } S = 65.1 \text{ mph}$$

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1838	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	117	vph
Length of first accel/decel lane	900	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	376	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	3300	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1838	117	376	vph
Peak-hour factor, PHF	0.92	0.90	0.94	

Peak 15-min volume, v_{15}	499	33	100	v
Trucks and buses	22	16	25	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.926	0.889	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2218	140	450	pcph

Estimation of V12 Merge Areas

$$L = 332.41 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.603 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 1337 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	2358	7200	No
FO			
v_{12} or v_{12}	881 pc/h	(Equation 13-14 or 13-17)	
v_{12} or v_{12}			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
v_{12} or v_{12}			
Is v_{12} or v_{12}	> 1.5 v_{12} / 2	Yes	
v_{12} or v_{12}			
If yes, v_{12}	= 1337	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1477	4600	No
12A			

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 11.3 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

$$\text{Intermediate speed variable, } M = 0.275$$

S

$$\text{Space mean speed in ramp influence area, } S = 62.3 \text{ mph}$$

R

$$\text{Space mean speed in outer lanes, } S = 68.6 \text{ mph}$$

0

$$\text{Space mean speed for all vehicles, } S = 64.5 \text{ mph}$$

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1794	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	54	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	161	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1794	54	161	vph
Peak-hour factor, PHF	0.92	0.92	0.90	

Peak 15-min volume, v ₁₅	487	15	45	v
Trucks and buses	22	36	46	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.901	0.847	0.813	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	2164	69	220	pcph

Estimation of V12 Merge Areas

L = (Equation 13-6 or 13-7)

EQ

P = 1.000 Using Equation 0

FM

v = v₁₂ (P) = 2164 pc/h

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v	2233	4800	No
FO			
v or v ₃	0 pc/h	(Equation 13-14 or 13-17)	
av ₃₄			
Is v or v ₃	> 2700 pc/h?	No	
av ₃₄			
Is v or v ₃	> 1.5 v ₁₂ / 2	No	
av ₃₄	12		
If yes, v _{12A}	= 2164	(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v	2233	4600	No
R12			

Level of Service Determination (if not F)

Density, D = $5.475 + 0.00734 v_R + 0.0078 v_A - 0.00627 L$ = 17.8 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, M = 0.301

S

Space mean speed in ramp influence area, S = 61.6 mph

R

Space mean speed in outer lanes, S = N/A mph

0

Space mean speed for all vehicles, S = 61.6 mph

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Jedburg Road (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.93
Shoulder width	2.5 ft	% Trucks and buses	11 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 352 veh/h
Opposing direction volume, Vo 562 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.3	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.968	0.989
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	391 pc/h	611 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	1.8	mi/h
Average travel speed, ATSD	34.0	mi/h
Percent Free Flow Speed, PFFS	78.1	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.989	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	383 pc/h	604 pc/h
Base percent time-spent-following,(note-4) BPTSFd	44.0	%
Adjustment for no-passing zones, fnp	36.1	
Percent time-spent-following, PTSFd	58.0	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.23
Peak 15-min vehicle-miles of travel, VMT15	95 veh-mi
Peak-hour vehicle-miles of travel, VMT60	352 veh-mi
Peak 15-min total travel time, TT15	2.8 veh-h
Capacity from ATS, CdATS	1681 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1681 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	34.0	mi/h
Percent time-spent-following, PTSFd (from above)	58.0	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 378.5
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 7.27
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Jedburg Road (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.94
Shoulder width	2.5 ft	% Trucks and buses	11 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	60 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 777 veh/h
Opposing direction volume, Vo 535 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.989	0.989
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	836 pc/h	575 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	1.4	mi/h
Average travel speed, ATSD	31.2	mi/h
Percent Free Flow Speed, PFFS	71.6	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	827 pc/h	569 pc/h
Base percent time-spent-following,(note-4) BPTSFd	67.7	%
Adjustment for no-passing zones, fnp	25.6	
Percent time-spent-following, PTSFd	82.9	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.49
Peak 15-min vehicle-miles of travel, VMT15	207 veh-mi
Peak-hour vehicle-miles of travel, VMT60	777 veh-mi
Peak 15-min total travel time, TT15	6.6 veh-h
Capacity from ATS, CdATS	1681 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1681 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	31.2	mi/h
Percent time-spent-following, PTSFd (from above)	82.9	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 826.6
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 7.66
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Volvo Car Drive (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	6.0 ft	% Trucks and buses	10 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	20 %
Up/down	- %	Access point density	8 /mi

Analysis direction volume, Vd 492 veh/h
Opposing direction volume, Vo 112 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.2	1.8
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.980	0.926
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	546 pc/h	131 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 0.0 mi/h
Adj. for access point density,(note-3) fA 2.0 mi/h

Free-flow speed, FFSd	48.0	mi/h
Adjustment for no-passing zones, fnp	0.4	mi/h
Average travel speed, ATSD	42.3	mi/h
Percent Free Flow Speed, PFFS	88.1	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	0.990
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	535 pc/h	123 pc/h
Base percent time-spent-following,(note-4) BPTSFd	46.9	%
Adjustment for no-passing zones, fnp	21.6	
Percent time-spent-following, PTSFd	64.5	%

Level of Service and Other Performance Measures

Level of service, LOS	B
Volume to capacity ratio, v/c	0.32
Peak 15-min vehicle-miles of travel, VMT15	134 veh-mi
Peak-hour vehicle-miles of travel, VMT60	492 veh-mi
Peak 15-min total travel time, TT15	3.2 veh-h
Capacity from ATS, CdATS	1574 veh/h
Capacity from PTSF, CdPTSF	1683 veh/h
Directional Capacity	1574 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	42.3	mi/h
Percent time-spent-following, PTSFd (from above)	64.5	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 534.8
Effective width of outside lane, We 24.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.13
Bicycle LOS E

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 27 (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.93
Shoulder width	1.0 ft	% Trucks and buses	16 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	30 /mi

Analysis direction volume, Vd 415 veh/h
Opposing direction volume, Vo 379 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.3	1.3
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.954	0.954
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	468 pc/h	427 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 7.5 mi/h

Free-flow speed, FFSd	43.3	mi/h
Adjustment for no-passing zones, fnp	2.6	mi/h
Average travel speed, ATSD	33.8	mi/h
Percent Free Flow Speed, PFFS	78.0	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	446 pc/h	408 pc/h
Base percent time-spent-following,(note-4) BPTSFd	45.4	%
Adjustment for no-passing zones, fnp	43.9	
Percent time-spent-following, PTSFd	68.3	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.27
Peak 15-min vehicle-miles of travel, VMT15	112 veh-mi
Peak-hour vehicle-miles of travel, VMT60	415 veh-mi
Peak 15-min total travel time, TT15	3.3 veh-h
Capacity from ATS, CdATS	1622 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1622 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	33.8	mi/h
Percent time-spent-following, PTSFd (from above)	68.3	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 446.2
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 9.87
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 27 (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.91
Shoulder width	2.5 ft	% Trucks and buses	16 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	10 /mi

Analysis direction volume, Vd 526 veh/h
Opposing direction volume, Vo 363 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.3
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.984	0.954
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	587 pc/h	418 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 2.5 mi/h

Free-flow speed, FFSd	49.5	mi/h
Adjustment for no-passing zones, fnp	2.6	mi/h
Average travel speed, ATSD	39.1	mi/h
Percent Free Flow Speed, PFFS	78.9	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	0.984
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	578 pc/h	405 pc/h
Base percent time-spent-following,(note-4) BPTSFd	53.9	%
Adjustment for no-passing zones, fnp	37.4	
Percent time-spent-following, PTSFd	75.9	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.35
Peak 15-min vehicle-miles of travel, VMT15	145 veh-mi
Peak-hour vehicle-miles of travel, VMT60	526 veh-mi
Peak 15-min total travel time, TT15	3.7 veh-h
Capacity from ATS, CdATS	1622 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1622 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	39.1	mi/h
Percent time-spent-following, PTSFd (from above)	75.9	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 578.0
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 9.87
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 453 (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	1.0 ft	% Trucks and buses	36 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	75 %
Up/down	- %	Access point density	4 /mi

Analysis direction volume, Vd 196 veh/h
Opposing direction volume, Vo 127 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.5	1.7
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.847	0.799
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	252 pc/h	173 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.7 mi/h
Adj. for access point density,(note-3) fA 1.0 mi/h

Free-flow speed, FFSd	39.3	mi/h
Adjustment for no-passing zones, fnp	3.2	mi/h
Average travel speed, ATSD	32.8	mi/h
Percent Free Flow Speed, PFFS	83.4	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.965	0.965
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	221 pc/h	143 pc/h
Base percent time-spent-following,(note-4) BPTSFd	23.5	%
Adjustment for no-passing zones, fnp	53.7	
Percent time-spent-following, PTSFd	56.1	%

Level of Service and Other Performance Measures

Level of service, LOS	B
Volume to capacity ratio, v/c	0.15
Peak 15-min vehicle-miles of travel, VMT15	53 veh-mi
Peak-hour vehicle-miles of travel, VMT60	196 veh-mi
Peak 15-min total travel time, TT15	1.6 veh-h
Capacity from ATS, CdATS	1358 veh/h
Capacity from PTSF, CdPTSF	1641 veh/h
Directional Capacity	1358 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.8	mi/h
Percent time-spent-following, PTSFd (from above)	56.1	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 213.0
Effective width of outside lane, We 12.50
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 24.27
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 453 (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	36 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	70 %
Up/down	- %	Access point density	16 /mi

Analysis direction volume, Vd 190 veh/h
Opposing direction volume, Vo 159 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.5	1.6
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.847	0.822
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	249 pc/h	215 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 4.0 mi/h

Free-flow speed, FFSd	36.8	mi/h
Adjustment for no-passing zones, fnp	3.4	mi/h
Average travel speed, ATSD	29.8	mi/h
Percent Free Flow Speed, PFFS	81.1	%

Percent Time-Spent-Following

Direction	Analysis(d)	Oposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.965	0.965
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	219 pc/h	183 pc/h
Base percent time-spent-following,(note-4) BPTSFd	23.3	%
Adjustment for no-passing zones, fnp	58.9	
Percent time-spent-following, PTSFd	55.4	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.15
Peak 15-min vehicle-miles of travel, VMT15	53 veh-mi
Peak-hour vehicle-miles of travel, VMT60	190 veh-mi
Peak 15-min total travel time, TT15	1.8 veh-h
Capacity from ATS, CdATS	1397 veh/h
Capacity from PTSF, CdPTSF	1641 veh/h
Directional Capacity	1397 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	29.8	mi/h
Percent time-spent-following, PTSFd (from above)	55.4	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 211.1
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 24.20
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Jedburg Road (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.93
Shoulder width	2.5 ft	% Trucks and buses	11 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 562 veh/h
Opposing direction volume, Vo 352 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.3
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.989	0.968
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	611 pc/h	391 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	2.8	mi/h
Average travel speed, ATSD	33.0	mi/h
Percent Free Flow Speed, PFFS	75.8	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	0.989
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	604 pc/h	383 pc/h
Base percent time-spent-following,(note-4) BPTSFd	54.8	%
Adjustment for no-passing zones, fnp	36.1	
Percent time-spent-following, PTSFd	76.9	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.36
Peak 15-min vehicle-miles of travel, VMT15	151 veh-mi
Peak-hour vehicle-miles of travel, VMT60	562 veh-mi
Peak 15-min total travel time, TT15	4.6 veh-h
Capacity from ATS, CdATS	1646 veh/h
Capacity from PTSF, CdPTSF	1682 veh/h
Directional Capacity	1646 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	33.0	mi/h
Percent time-spent-following, PTSFd (from above)	76.9	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 604.3
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 7.50
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Jedburg Road (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.94
Shoulder width	2.5 ft	% Trucks and buses	11 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	60 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 535 veh/h
Opposing direction volume, Vo 777 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.989	0.989
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	575 pc/h	836 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	0.8	mi/h
Average travel speed, ATSD	31.8	mi/h
Percent Free Flow Speed, PFFS	73.1	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	569 pc/h	827 pc/h
Base percent time-spent-following,(note-4) BPTSFd	59.4	%
Adjustment for no-passing zones, fnp	25.6	
Percent time-spent-following, PTSFd	69.8	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.34
Peak 15-min vehicle-miles of travel, VMT15	142 veh-mi
Peak-hour vehicle-miles of travel, VMT60	535 veh-mi
Peak 15-min total travel time, TT15	4.5 veh-h
Capacity from ATS, CdATS	1681 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1681 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	31.8	mi/h
Percent time-spent-following, PTSFd (from above)	69.8	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 569.1
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 7.47
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Volvo Car Drive (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	6.0 ft	% Trucks and buses	10 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	20 %
Up/down	- %	Access point density	8 /mi

Analysis direction volume, Vd 112 veh/h
Opposing direction volume, Vo 492 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.8	1.2
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.926	0.980
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	131 pc/h	546 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 0.0 mi/h
Adj. for access point density,(note-3) fA 2.0 mi/h

Free-flow speed, FFSd	48.0	mi/h
Adjustment for no-passing zones, fnp	0.7	mi/h
Average travel speed, ATSD	42.1	mi/h
Percent Free Flow Speed, PFFS	87.7	%

Percent Time-Spent-Following

Direction	Analysis(d)	Oposing (o)
PCE for trucks, ET	1.1	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.990	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	123 pc/h	535 pc/h
Base percent time-spent-following,(note-4) BPTSFd	18.7	%
Adjustment for no-passing zones, fnp	21.6	
Percent time-spent-following, PTSFd	22.7	%

Level of Service and Other Performance Measures

Level of service, LOS	B
Volume to capacity ratio, v/c	0.08
Peak 15-min vehicle-miles of travel, VMT15	30 veh-mi
Peak-hour vehicle-miles of travel, VMT60	112 veh-mi
Peak 15-min total travel time, TT15	0.7 veh-h
Capacity from ATS, CdATS	1666 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1666 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	42.1	mi/h
Percent time-spent-following, PTSFd (from above)	22.7	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 121.7
Effective width of outside lane, We 31.92
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 2.16
Bicycle LOS B

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 27 (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.93
Shoulder width	1.0 ft	% Trucks and buses	16 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	30 /mi

Analysis direction volume, Vd 379 veh/h
Opposing direction volume, Vo 415 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.3	1.3
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.954	0.954
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	427 pc/h	468 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 7.5 mi/h

Free-flow speed, FFSd	43.3	mi/h
Adjustment for no-passing zones, fnp	2.4	mi/h
Average travel speed, ATSD	34.0	mi/h
Percent Free Flow Speed, PFFS	78.4	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	408 pc/h	446 pc/h
Base percent time-spent-following,(note-4) BPTSFd	45.0	%
Adjustment for no-passing zones, fnp	43.9	
Percent time-spent-following, PTSFd	66.0	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.25
Peak 15-min vehicle-miles of travel, VMT15	102 veh-mi
Peak-hour vehicle-miles of travel, VMT60	379 veh-mi
Peak 15-min total travel time, TT15	3.0 veh-h
Capacity from ATS, CdATS	1622 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1622 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	34.0	mi/h
Percent time-spent-following, PTSFd (from above)	66.0	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 407.5
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 9.83
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 27 (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.91
Shoulder width	2.5 ft	% Trucks and buses	16 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	10 /mi

Analysis direction volume, Vd 363 veh/h
Opposing direction volume, Vo 526 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.3	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.954	0.984
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	418 pc/h	587 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 2.5 mi/h

Free-flow speed, FFSd	49.5	mi/h
Adjustment for no-passing zones, fnp	1.9	mi/h
Average travel speed, ATSD	39.8	mi/h
Percent Free Flow Speed, PFFS	80.3	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.984	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	405 pc/h	578 pc/h
Base percent time-spent-following,(note-4) BPTSFd	46.0	%
Adjustment for no-passing zones, fnp	37.4	
Percent time-spent-following, PTSFd	61.4	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.25
Peak 15-min vehicle-miles of travel, VMT15	100 veh-mi
Peak-hour vehicle-miles of travel, VMT60	363 veh-mi
Peak 15-min total travel time, TT15	2.5 veh-h
Capacity from ATS, CdATS	1673 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1673 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	39.8	mi/h
Percent time-spent-following, PTSFd (from above)	61.4	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 398.9
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 9.68
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 453 (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	1.0 ft	% Trucks and buses	36 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	75 %
Up/down	- %	Access point density	4 /mi

Analysis direction volume, Vd 127 veh/h
Opposing direction volume, Vo 196 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.7	1.5
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.799	0.847
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	173 pc/h	252 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.7 mi/h
Adj. for access point density,(note-3) fA 1.0 mi/h

Free-flow speed, FFSd	39.3	mi/h
Adjustment for no-passing zones, fnp	3.3	mi/h
Average travel speed, ATSD	32.7	mi/h
Percent Free Flow Speed, PFFS	83.2	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.965	0.965
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	143 pc/h	221 pc/h
Base percent time-spent-following,(note-4) BPTSFd	16.7	%
Adjustment for no-passing zones, fnp	53.7	
Percent time-spent-following, PTSFd	37.8	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.10
Peak 15-min vehicle-miles of travel, VMT15	35 veh-mi
Peak-hour vehicle-miles of travel, VMT60	127 veh-mi
Peak 15-min total travel time, TT15	1.1 veh-h
Capacity from ATS, CdATS	1440 veh/h
Capacity from PTSF, CdPTSF	1641 veh/h
Directional Capacity	1440 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.7	mi/h
Percent time-spent-following, PTSFd (from above)	37.8	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 138.0
Effective width of outside lane, We 17.06
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 23.38
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 453 (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	36 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	70 %
Up/down	- %	Access point density	16 /mi

Analysis direction volume, Vd 159 veh/h
Opposing direction volume, Vo 190 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.6	1.5
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.822	0.847
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	215 pc/h	249 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 4.0 mi/h

Free-flow speed, FFSd	36.8	mi/h
Adjustment for no-passing zones, fnp	3.2	mi/h
Average travel speed, ATSD	30.0	mi/h
Percent Free Flow Speed, PFFS	81.6	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.965	0.965
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	183 pc/h	219 pc/h
Base percent time-spent-following,(note-4) BPTSFd	20.7	%
Adjustment for no-passing zones, fnp	58.9	
Percent time-spent-following, PTSFd	47.5	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.13
Peak 15-min vehicle-miles of travel, VMT15	44 veh-mi
Peak-hour vehicle-miles of travel, VMT60	159 veh-mi
Peak 15-min total travel time, TT15	1.5 veh-h
Capacity from ATS, CdATS	1440 veh/h
Capacity from PTSF, CdPTSF	1641 veh/h
Directional Capacity	1440 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	30.0	mi/h
Percent time-spent-following, PTSFd (from above)	47.5	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 176.7
Effective width of outside lane, We 15.66
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 23.73
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2010	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	31	vph
Length of first accel/decel lane	465	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	163	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2010	31	163	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v_{15}	546	9	45	v
Trucks and buses	10	52	24	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.794	0.893	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2294	43	203	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 2294$ pc/h

$v_{12} = 2294$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	2294	4800	No
$v_{12} = v_F - v_R$	2251	4800	No
$v_{12} = v_F$	43	2000	No
$v_{12} \text{ or } v_{12}$	0 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_{12} > 2700$ pc/h?		No	
Is $v_{12} \text{ or } v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 2294$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2294	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 19.8$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.432$

S

Space mean speed in ramp influence area, $S = 57.9$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 57.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2142	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	135	vph
Length of first accel/decel lane	250	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	519	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	4000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
	Ramp			
Volume, V (vph)	2142	135	519	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v_{15}	582	38	144	v
Trucks and buses	10	8	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.962	0.966	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2445	156	597	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.692$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 1739$ pc/h

$v_{12} = 1739$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	2445	7200	No
$v_{12} = v_F - v_R$	2289	7200	No
$v_{12} = v_F$	156	2000	No
$v_{12} = v_F$	706 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} > 2700$ pc/h?	No		
Is $v_{12} > 1.5 v_{12} / 2$	No		
If yes, $v_{12} = 1739$	(Equation 13-15, 13-16, 13-18, or 13-19)		

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1739	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 17.0$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.442$

S

Space mean speed in ramp influence area, $S = 57.6$ mph

R

Space mean speed in outer lanes, S = 76.8 mph

0

Space mean speed for all vehicles, S = 62.1 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2526	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	31	vph
Length of first accel/decel lane	1200	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	378	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	3500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2526	31	378	vph
Peak-hour factor, PHF	0.92	0.92	0.92	

Peak 15-min volume, v ₁₅	686	8	103	v
Trucks and buses	10	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.952	0.952	0.952	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	2883	35	431	pcph

Estimation of V₁₂ Diverge Areas

L = (Equation 13-12 or 13-13)

EQ

P = 0.686 Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 1990$ pc/h

12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
v = v Fi F	2883	7200	No
v = v - v FO F R	2848	7200	No
v R	35	2000	No
v or v 3 av34	893 pc/h	(Equation 13-14 or 13-17)	
Is v or v 3 av34	> 2700 pc/h?	No	
Is v or v 3 av34	> 1.5 v /2	No	
	12		
If yes, v = 1990 12A	(Equation 13-15, 13-16, 13-18, or 13-19)		

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1990	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 10.6$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.431$

S

Space mean speed in ramp influence area, $S = 57.9$ mph

R

Space mean speed in outer lanes, S = 76.8 mph

0

Space mean speed for all vehicles, S = 62.7 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2873	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	158	vph
Length of first accel/decel lane	180	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	644	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2900	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2873	158	644	vph
Peak-hour factor, PHF	0.92	0.91	0.90	

Peak 15-min volume, v_{15}	781	43	179	v
Trucks and buses	10	19	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.913	0.966	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3279	190	741	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.669$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 2257$ pc/h

$v_{12} = 2257$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	3279	7200	No
$v_{12} = v_F + v_R$	3089	7200	No
$v_{12} = v_F + v_R$	190	2000	No
$v_{12} = v_F + v_R$	1022 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} > 2700$ pc/h?	No		
Is $v_{12} > 1.5 v_{12} / 2$	No		
If yes, $v_{12} = 2257$	(Equation 13-15, 13-16, 13-18, or 13-19)		

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2257	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 22.0$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.445$

S

Space mean speed in ramp influence area, $S = 57.5$ mph

R

Space mean speed in outer lanes, S = 76.7 mph

0

Space mean speed for all vehicles, S = 62.4 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3490	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	627	vph
Length of first accel/decel lane	850	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	155	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	750	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3490	627	155	vph
Peak-hour factor, PHF	0.93	0.95	0.90	

Peak 15-min volume, v_{15}	938	165	43	v
Trucks and buses	15	6	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.971	0.966	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	4034	680	178	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.628$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 2786$ pc/h

$v_{12} = 2786$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	4034	7200	No
$v_{12} = v_F - v_R$	3354	7200	No
$v_{12} = v_R$	680	2000	No
$v_{12} \text{ or } v_{12}$	1248 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_{12} > 2700$ pc/h?		No	
Is $v_{12} \text{ or } v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 2786$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2786	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 20.6$ pc/mi/ln

$D = 20.6$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.489$

S

Space mean speed in ramp influence area, $S = 56.3$ mph

R

Space mean speed in outer lanes, S = 75.8 mph

0

Space mean speed for all vehicles, S = 61.2 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3767	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	277	vph
Length of first accel/decel lane	150	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	627	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	920	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3767	277	627	vph
Peak-hour factor, PHF	0.93	0.95	0.95	

Peak 15-min volume, v_{15}	1013	73	165	v
Trucks and buses	15	6	6	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	4354	300	680	pcph

Estimation of V12 Diverge Areas

$$L = 755.98 \text{ (Equation 13-12 or 13-13)}$$

EQ

$$P = 0.637 \text{ Using Equation 5}$$

FD

$$v_{12} = v_F + (v_R - v_F) P = 2884 \text{ pc/h}$$

12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$v = v$ Fi F	4354	7200	No
$v = v - v$ FO F R	4054	7200	No
v R	300	2000	No
v or v 3 av34	1470 pc/h	(Equation 13-14 or 13-17)	
Is v or v 3 av34	> 2700 pc/h?		No
Is v or v 3 av34	> 1.5 v /2		No
If yes, v 12A	2884	(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2884	4400	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L = 27.7 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

$$\text{Intermediate speed variable, } D = 0.455$$

S

$$\text{Space mean speed in ramp influence area, } S = 57.3 \text{ mph}$$

R

Space mean speed in outer lanes, S = 75.0 mph

0

Space mean speed for all vehicles, S = 62.2 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3018	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	124	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane	1500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	94	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3018	124	94	vph
Peak-hour factor, PHF	0.93	0.92	0.92	

Peak 15-min volume, v ₁₅	811	34	26	v
Trucks and buses	15	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.930	0.952	0.952	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	3489	142	107	pcph

Estimation of V₁₂ Diverge Areas

L = (Equation 13-12 or 13-13)

EQ

P = 0.450 Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 1648$ pc/h

12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$v_F = v_{12}$	3489	7200	No
$v_F = v_{12} - v_R$	3347	7200	No
v_R	142	4000	No
v_{12} or v_R	1841 pc/h	(Equation 13-14 or 13-17)	
v_{12} or $v_R > 2700$ pc/h?		No	
v_{12} or $v_R > 1.5 v_{12} / 2$		Yes	
If yes, $v_{12} = 1993$	(Equation 13-15, 13-16, 13-18, or 13-19)		
12A			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	1993	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = -19.1$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable, $D = 0.441$

S

Space mean speed in ramp influence area, $S = 57.7$ mph

R

Space mean speed in outer lanes, S = 74.9 mph

0

Space mean speed for all vehicles, S = 64.0 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2988	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	508	vph
Length of first accel/decel lane	250	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	155	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	3300	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2988	508	155	vph
Peak-hour factor, PHF	0.93	0.91	0.90	

Peak 15-min volume, v_{15}	803	140	43	v
Trucks and buses	15	7	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.966	0.966	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3454	578	178	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.647$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 2439$ pc/h

$v_{12} = 2439$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	3454	7200	No
$v_{12} = v_F$			
$v_{12} = v_F - v_R$	2876	7200	No
$v_{12} = v_F - v_R$			
$v_{12} = v_F$	578	2000	No
$v_{12} = v_F$			
$v_{12} = v_F$	1015 pc/h	(Equation 13-14 or 13-17)	
$v_{12} = v_F$			
Is $v_{12} = v_F > 2700$ pc/h?		No	
$v_{12} = v_F$			
Is $v_{12} = v_F > 1.5 v_{12} / 2$		No	
$v_{12} = v_F$			
If yes, $v_{12} = 2439$		(Equation 13-15, 13-16, 13-18, or 13-19)	
$v_{12} = 2439$			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2439	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 23.0$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.480$

S

Space mean speed in ramp influence area, $S = 56.6$ mph

R

Space mean speed in outer lanes, S = 76.7 mph

0

Space mean speed for all vehicles, S = 61.3 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2635	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	166	vph
Length of first accel/decel lane	475	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	57	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2635	166	57	vph
Peak-hour factor, PHF	0.93	0.90	0.90	

Peak 15-min volume, v_{15}	708	46	16	v
Trucks and buses	15	21	24	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.905	0.893	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3046	204	71	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 3046$ pc/h

$v_{12} = 3046$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	3046	4800	No
$v_{12} = v_F - v_R$	2842	4800	No
$v_{12} = v_F$	204	2000	No
$v_{12} \text{ or } v_{12}$	0 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_{12} > 2700$ pc/h?		No	
Is $v_{12} \text{ or } v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 3046$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3046	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 26.2$ pc/mi/ln

$D = 26.2$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.446$

S

Space mean speed in ramp influence area, $S = 57.5$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 57.5 mph

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: West of SC 453
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2010	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	546	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1147	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.2	mi/h
Free-flow speed, FFS	72.2	mi/h

LOS and Performance Measures

Flow rate, vp	1147	pc/h/ln
Free-flow speed, FFS	72.2	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	2	
Density, D	16.4	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Between SC 453 Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1979	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	538	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1129	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.33	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.3	mi/h
Free-flow speed, FFS	74.1	mi/h

LOS and Performance Measures

Flow rate, vp	1129	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	74.8	mi/h
Number of lanes, N	2	
Density, D	15.1	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
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Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: SC 453 to SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2142	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	582	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1222	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	1222	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	74.5	mi/h
Number of lanes, N	2	
Density, D	16.4	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

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Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Between SC 27 Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2007	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	545	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	764	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, v_p	764	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	10.2	pc/mi/ln
Level of service, LOS	A	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Between SC 27 & Volvo
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2526	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	686	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	961	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, v_p	961	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	12.8	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
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Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Between Volvo Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2495	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	678	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	949	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, v_p	949	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	12.7	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Volvo to Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2873	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	781	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1093	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1093	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	74.9	mi/h
Number of lanes, N	3	
Density, D	14.6	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2715	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	738	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1033	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.50	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.8	mi/h
Free-flow speed, FFS	73.6	mi/h

LOS and Performance Measures

Flow rate, vp	1033	pc/h/ln
Free-flow speed, FFS	73.6	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	13.8	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

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E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Jedburg to Nexton
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3359	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	913	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1278	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.20	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.8	mi/h
Free-flow speed, FFS	71.6	mi/h

LOS and Performance Measures

Flow rate, vp	1278	pc/h/ln
Free-flow speed, FFS	71.6	mi/h
Average passenger-car speed, S	69.9	mi/h
Number of lanes, N	3	
Density, D	18.3	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

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Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Nexton to Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3767	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	1013	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1451	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.33	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	4.1	mi/h
Free-flow speed, FFS	71.3	mi/h

LOS and Performance Measures

Flow rate, vp	1451	pc/h/ln
Free-flow speed, FFS	71.3	mi/h
Average passenger-car speed, S	69.3	mi/h
Number of lanes, N	3	
Density, D	20.9	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

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Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2863	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	770	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1103	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1103	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	74.9	mi/h
Number of lanes, N	3	
Density, D	14.7	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

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Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3490	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	938	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1345	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1345	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	73.7	mi/h
Number of lanes, N	3	
Density, D	18.3	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

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Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Jedburg to Volvo
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3018	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	811	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1163	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	1163	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	74.7	mi/h
Number of lanes, N	3	
Density, D	15.6	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
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Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between Volvo Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2894	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	778	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1115	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1115	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	74.9	mi/h
Number of lanes, N	3	
Density, D	14.9	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
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Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between Volvo & SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2988	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	803	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1151	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1151	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	74.7	mi/h
Number of lanes, N	3	
Density, D	15.4	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between SC 27 Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2480	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	667	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	956	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	956	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	12.7	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: SC 27 to SC 453
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2635	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	708	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1523	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	1523	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	72.0	mi/h
Number of lanes, N	2	
Density, D	21.2	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between SC 453 Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2469	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	664	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1427	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.33	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.3	mi/h
Free-flow speed, FFS	74.1	mi/h

LOS and Performance Measures

Flow rate, vp	1427	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	73.0	mi/h
Number of lanes, N	2	
Density, D	19.6	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: West of SC 453
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2526	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	679	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1460	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.2	mi/h
Free-flow speed, FFS	72.2	mi/h

LOS and Performance Measures

Flow rate, vp	1460	pc/h/ln
Free-flow speed, FFS	72.2	mi/h
Average passenger-car speed, S	69.2	mi/h
Number of lanes, N	2	
Density, D	21.1	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1979	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	163	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	31	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1979	163	31	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v_{15}	538	45	9	v
Trucks and buses	10	24	52	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.893	0.794	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2259	203	43	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)

EQ

$P = 1.000$ Using Equation 0

FM

$v_{12} = v_{12} (P) = 2259$ pc/h

FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	2462	4800	No
FO			
v_{12} or v_{12}	0 pc/h	(Equation 13-14 or 13-17)	
$\frac{v_{12}}{3}$ av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
$\frac{v_{12}}{3}$ av34			
Is v_{12} or v_{12}	$> 1.5 \frac{v_{12}}{12}$	No	
$\frac{v_{12}}{3}$ av34			
If yes, v_{12}	$= 2259$	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2462	4600	No
R12			

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 \frac{v_{12}}{R} + 0.0078 \frac{v_{12}}{A} - 0.00627 L = 19.6$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.311$

S

Space mean speed in ramp influence area, $S = 61.3$ mph

R

Space mean speed in outer lanes, $S = N/A$ mph

0

Space mean speed for all vehicles, $S = 61.3$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2007	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	519	vph
Length of first accel/decel lane	900	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	135	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	4000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2007	519	135	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v_{15}	545	144	38	v
Trucks and buses	10	7	8	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.966	0.962	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2291	597	156	pcph

Estimation of V12 Merge Areas

$$L = 445.83 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.603 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 1381 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	2888	7200	No
FO			
v_{12} or v_{12}	910 pc/h	(Equation 13-14 or 13-17)	
$\frac{v_{12}}{3}$ av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
$\frac{v_{12}}{3}$ av34			
Is v_{12} or v_{12}	> 1.5 $v_{12} / 2$	Yes	
$\frac{v_{12}}{3}$ av34	12		
If yes, v_{12}	= 1381	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1978	4600	No
12A			

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 15.0 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.286$

S

Space mean speed in ramp influence area, $S = 62.0$ mph

R

Space mean speed in outer lanes, $S = 68.5$ mph

0

Space mean speed for all vehicles, $S = 63.9$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2495	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-flow speed on ramp	35.0	mph
Volume on ramp	378	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane	1500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	31	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	3500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2495	378	31	vph
Peak-hour factor, PHF	0.92	0.92	0.92	

Peak 15-min volume, v_{15}	678	103	8	v
Trucks and buses	10	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2848	431	35	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)

EQ

$P = 0.555$ Using Equation 0

FM

$v_{12} = v_{12} (P) = 1581$ pc/h

12 F FM

Capacity Checks

v_{12}	Actual 3279	Maximum 7200	LOS F? No
FO			
v_{12} or v_{12}	1267 pc/h	(Equation 13-14 or 13-17)	
v_{12} or v_{12}			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
v_{12} or v_{12}			
Is v_{12} or v_{12}	$> 1.5 v_{12} / 2$	Yes	
v_{12} or v_{12}			
If yes, v_{12}	$= 1627$	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

v_{12}	Actual 2058	Max Desirable 4600	Violation? No
12A			

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = -6.9$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable, $M = 0.037$

S

Space mean speed in ramp influence area, $S = 69.0$ mph

R

Space mean speed in outer lanes, $S = 67.4$ mph

0

Space mean speed for all vehicles, $S = 68.4$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2715	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	644	vph
Length of first accel/decel lane	1120	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	158	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2900	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2715	644	158	vph
Peak-hour factor, PHF	0.92	0.90	0.91	

Peak 15-min volume, v_{15}	738	179	43	v
Trucks and buses	10	7	19	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.966	0.913	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3099	741	190	pcph

Estimation of V12 Merge Areas

$$L = 747.24 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.609 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 1887 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	3840	7200	No
FO			
v_{12} or v_{12}	1212 pc/h	(Equation 13-14 or 13-17)	
3 av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
3 av34			
Is v_{12} or v_{12}	> 1.5 $v_{12} / 2$	Yes	
3 av34	12		
If yes, v_{12}	= 1887	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2628	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 18.6 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.297$

S

Space mean speed in ramp influence area, $S = 61.7 \text{ mph}$

R

Space mean speed in outer lanes, $S = 67.4 \text{ mph}$

0

Space mean speed for all vehicles, $S = 63.4 \text{ mph}$

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2863	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	155	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	627	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	750	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2863	155	627	vph
Peak-hour factor, PHF	0.93	0.90	0.95	

Peak 15-min volume, v_{15}	770	43	165	v
Trucks and buses	15	7	6	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.966	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3309	178	680	pcph

Estimation of V12 Merge Areas

$$L = 840.42 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.614 \text{ Using Equation 2}$$

FM

$$v_{12} = v_{12} (P) = 2031 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	3487	7200	No
FO			
v_{12} or v_{12}	1278 pc/h	(Equation 13-14 or 13-17)	
3 av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
3 av34			
Is v_{12} or v_{12}	> 1.5 $v_{12} / 2$	Yes	
3 av34	12		
If yes, v_{12}	= 2031	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2209	4600	No
12A			

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 13.2 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.252$

S

Space mean speed in ramp influence area, $S = 63.0 \text{ mph}$

R

Space mean speed in outer lanes, $S = 67.2 \text{ mph}$

0

Space mean speed for all vehicles, $S = 64.4 \text{ mph}$

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2894	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	94	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	124	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2894	94	124	vph
Peak-hour factor, PHF	0.93	0.92	0.92	

Peak 15-min volume, v_{15}	778	26	34	v
Trucks and buses	15	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3345	107	142	pcph

Estimation of V12 Merge Areas

$$L = 832.93 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.619 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 2072 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	3452	7200	No
FO			
v_{12} or v_{12}	1273 pc/h	(Equation 13-14 or 13-17)	
3 av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
3 av34			
Is v_{12} or v_{12}	> 1.5 $v_{12} / 2$	Yes	
3 av34	12		
If yes, v_{12}	= 2072	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2179	4600	No
12A			

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 13.0 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.250$

S

Space mean speed in ramp influence area, $S = 63.0$ mph

R

Space mean speed in outer lanes, $S = 67.2$ mph

0

Space mean speed for all vehicles, $S = 64.5$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2480	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	155	vph
Length of first accel/decel lane	900	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	508	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	3300	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2480	155	508	vph
Peak-hour factor, PHF	0.93	0.90	0.91	

Peak 15-min volume, v_{15}	667	43	140	v
Trucks and buses	15	7	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.966	0.966	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2867	178	578	pcph

Estimation of V12 Merge Areas

$$L = 479.43 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.603 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 1728 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	3045	7200	No
FO			
v_{12} or v_{12}	1139 pc/h	(Equation 13-14 or 13-17)	
$\frac{v_{12}}{3}$ av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
$\frac{v_{12}}{3}$ av34			
Is v_{12} or v_{12}	> 1.5 $v_{12} / 2$	Yes	
$\frac{v_{12}}{3}$ av34	12		
If yes, v_{12}	= 1728	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	1906	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_A - 0.00627 L = 14.6 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.284$

S

Space mean speed in ramp influence area, $S = 62.0$ mph

R

Space mean speed in outer lanes, $S = 67.7$ mph

O

Space mean speed for all vehicles, $S = 64.0$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2469	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	57	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	166	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2469	57	166	vph
Peak-hour factor, PHF	0.93	0.90	0.90	

Peak 15-min volume, v ₁₅	664	16	46	v
Trucks and buses	15	24	21	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.930	0.893	0.905	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	2854	71	204	pcph

Estimation of V₁₂ Merge Areas

L = (Equation 13-6 or 13-7)

EQ

P = 1.000 Using Equation 0

FM

v = v₁₂ (P) = 2854 pc/h

FM

Capacity Checks

	Actual	Maximum	LOS F?
v	2925	4800	No
FO			
v or v ₃	0 pc/h	(Equation 13-14 or 13-17)	
av ₃₄			
Is v or v ₃	> 2700 pc/h?	No	
av ₃₄			
Is v or v ₃	> 1.5 v ₁₂ / 2	No	
av ₃₄			
If yes, v _{12A}	= 2854	(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v	2925	4600	No
R ₁₂			

Level of Service Determination (if not F)

Density, D = $5.475 + 0.00734 v_R + 0.0078 v_A - 0.00627 L$ = 23.2 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, M = 0.338

S

Space mean speed in ramp influence area, S = 60.5 mph

R

Space mean speed in outer lanes, S = N/A mph

0

Space mean speed for all vehicles, S = 60.5 mph

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Jedburg Road (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.95
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 561 veh/h
Opposing direction volume, Vo 407 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.3
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.993	0.979
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	595 pc/h	438 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	2.5	mi/h
Average travel speed, ATSD	33.0	mi/h
Percent Free Flow Speed, PFFS	75.8	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	591 pc/h	428 pc/h
Base percent time-spent-following,(note-4) BPTSFd	56.4	%
Adjustment for no-passing zones, fnp	37.0	
Percent time-spent-following, PTSFd	77.9	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.35
Peak 15-min vehicle-miles of travel, VMT15	148 veh-mi
Peak-hour vehicle-miles of travel, VMT60	561 veh-mi
Peak 15-min total travel time, TT15	4.5 veh-h
Capacity from ATS, CdATS	1664 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1664 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	33.0	mi/h
Percent time-spent-following, PTSFd (from above)	77.9	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 590.5
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.95
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Jedburg Road (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	60 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 686 veh/h
Opposing direction volume, Vo 836 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.993	1.000
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	751 pc/h	909 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	0.7	mi/h
Average travel speed, ATSD	29.9	mi/h
Percent Free Flow Speed, PFFS	68.8	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	746 pc/h	909 pc/h
Base percent time-spent-following,(note-4) BPTSFd	68.2	%
Adjustment for no-passing zones, fnp	21.9	
Percent time-spent-following, PTSFd	78.1	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.44
Peak 15-min vehicle-miles of travel, VMT15	186 veh-mi
Peak-hour vehicle-miles of travel, VMT60	686 veh-mi
Peak 15-min total travel time, TT15	6.2 veh-h
Capacity from ATS, CdATS	1700 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1700 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	29.9	mi/h
Percent time-spent-following, PTSFd (from above)	78.1	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 745.7
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 6.07
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Volvo Car Drive (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	6.0 ft	% Trucks and buses	10 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	20 %
Up/down	- %	Access point density	8 /mi

Analysis direction volume, Vd 155 veh/h
Opposing direction volume, Vo 472 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.6	1.2
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.943	0.980
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	179 pc/h	524 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 0.0 mi/h
Adj. for access point density,(note-3) fA 2.0 mi/h

Free-flow speed, FFSd	48.0	mi/h
Adjustment for no-passing zones, fnp	0.7	mi/h
Average travel speed, ATSD	41.8	mi/h
Percent Free Flow Speed, PFFS	87.2	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.990	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	170 pc/h	513 pc/h
Base percent time-spent-following,(note-4) BPTSFd	24.0	%
Adjustment for no-passing zones, fnp	24.8	
Percent time-spent-following, PTSFd	30.2	%

Level of Service and Other Performance Measures

Level of service, LOS	B
Volume to capacity ratio, v/c	0.11
Peak 15-min vehicle-miles of travel, VMT15	42 veh-mi
Peak-hour vehicle-miles of travel, VMT60	155 veh-mi
Peak 15-min total travel time, TT15	1.0 veh-h
Capacity from ATS, CdATS	1666 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1666 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	41.8	mi/h
Percent time-spent-following, PTSFd (from above)	30.2	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 168.5
Effective width of outside lane, We 28.05
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 3.48
Bicycle LOS C

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 27 (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	7 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	30 /mi

Analysis direction volume, Vd 452 veh/h
Opposing direction volume, Vo 581 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.2	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.986	0.993
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	509 pc/h	650 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 7.5 mi/h

Free-flow speed, FFSd	43.3	mi/h
Adjustment for no-passing zones, fnp	1.6	mi/h
Average travel speed, ATSD	32.7	mi/h
Percent Free Flow Speed, PFFS	75.4	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	502 pc/h	646 pc/h
Base percent time-spent-following,(note-4) BPTSFd	53.3	%
Adjustment for no-passing zones, fnp	34.3	
Percent time-spent-following, PTSFd	68.3	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.30
Peak 15-min vehicle-miles of travel, VMT15	126 veh-mi
Peak-hour vehicle-miles of travel, VMT60	452 veh-mi
Peak 15-min total travel time, TT15	3.9 veh-h
Capacity from ATS, CdATS	1688 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1688 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.7	mi/h
Percent time-spent-following, PTSFd (from above)	68.3	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 502.2
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 6.01
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 27 (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	10 /mi

Analysis direction volume, Vd 414 veh/h
Opposing direction volume, Vo 504 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.2	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.986	0.993
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	467 pc/h	564 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 2.5 mi/h

Free-flow speed, FFSd	49.5	mi/h
Adjustment for no-passing zones, fnp	2.0	mi/h
Average travel speed, ATSD	39.5	mi/h
Percent Free Flow Speed, PFFS	79.7	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	460 pc/h	560 pc/h
Base percent time-spent-following,(note-4) BPTSFd	49.7	%
Adjustment for no-passing zones, fnp	38.1	
Percent time-spent-following, PTSFd	66.9	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.27
Peak 15-min vehicle-miles of travel, VMT15	115 veh-mi
Peak-hour vehicle-miles of travel, VMT60	414 veh-mi
Peak 15-min total travel time, TT15	2.9 veh-h
Capacity from ATS, CdATS	1688 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1688 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	39.5	mi/h
Percent time-spent-following, PTSFd (from above)	66.9	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 460.0
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.83
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 453 (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	24 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	75 %
Up/down	- %	Access point density	4 /mi

Analysis direction volume, Vd 156 veh/h
Opposing direction volume, Vo 180 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.6	1.5
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.874	0.893
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	198 pc/h	224 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.7 mi/h
Adj. for access point density,(note-3) fA 1.0 mi/h

Free-flow speed, FFSd	39.3	mi/h
Adjustment for no-passing zones, fnp	3.5	mi/h
Average travel speed, ATSD	32.6	mi/h
Percent Free Flow Speed, PFFS	82.8	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.977	0.977
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	177 pc/h	205 pc/h
Base percent time-spent-following,(note-4) BPTSFd	19.3	%
Adjustment for no-passing zones, fnp	59.3	
Percent time-spent-following, PTSFd	46.8	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.12
Peak 15-min vehicle-miles of travel, VMT15	43 veh-mi
Peak-hour vehicle-miles of travel, VMT60	156 veh-mi
Peak 15-min total travel time, TT15	1.3 veh-h
Capacity from ATS, CdATS	1518 veh/h
Capacity from PTSF, CdPTSF	1660 veh/h
Directional Capacity	1518 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.6	mi/h
Percent time-spent-following, PTSFd (from above)	46.8	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 173.3
Effective width of outside lane, We 15.25
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 13.97
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 453 (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	24 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	70 %
Up/down	- %	Access point density	16 /mi

Analysis direction volume, Vd 170 veh/h
Opposing direction volume, Vo 243 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.5	1.4
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.893	0.912
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	212 pc/h	296 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 4.0 mi/h

Free-flow speed, FFSd	36.8	mi/h
Adjustment for no-passing zones, fnp	2.9	mi/h
Average travel speed, ATSD	30.0	mi/h
Percent Free Flow Speed, PFFS	81.5	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.977	0.977
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	193 pc/h	276 pc/h
Base percent time-spent-following,(note-4) BPTSFd	22.7	%
Adjustment for no-passing zones, fnp	54.2	
Percent time-spent-following, PTSFd	45.0	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.12
Peak 15-min vehicle-miles of travel, VMT15	47 veh-mi
Peak-hour vehicle-miles of travel, VMT60	170 veh-mi
Peak 15-min total travel time, TT15	1.6 veh-h
Capacity from ATS, CdATS	1550 veh/h
Capacity from PTSF, CdPTSF	1660 veh/h
Directional Capacity	1550 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	30.0	mi/h
Percent time-spent-following, PTSFd (from above)	45.0	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 188.9
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 14.33
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Jedburg Road (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.95
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 407 veh/h
Opposing direction volume, Vo 561 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.3	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.979	0.993
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	438 pc/h	595 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	1.8	mi/h
Average travel speed, ATSD	33.7	mi/h
Percent Free Flow Speed, PFFS	77.4	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	428 pc/h	591 pc/h
Base percent time-spent-following,(note-4) BPTSFd	47.8	%
Adjustment for no-passing zones, fnp	37.0	
Percent time-spent-following, PTSFd	63.3	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.26
Peak 15-min vehicle-miles of travel, VMT15	107 veh-mi
Peak-hour vehicle-miles of travel, VMT60	407 veh-mi
Peak 15-min total travel time, TT15	3.2 veh-h
Capacity from ATS, CdATS	1688 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1688 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	33.7	mi/h
Percent time-spent-following, PTSFd (from above)	63.3	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 428.4
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.79
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Jedburg Road (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	60 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 836 veh/h
Opposing direction volume, Vo 686 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	1.000	0.993
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	909 pc/h	751 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	0.9	mi/h
Average travel speed, ATSD	29.7	mi/h
Percent Free Flow Speed, PFFS	68.3	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	909 pc/h	746 pc/h
Base percent time-spent-following,(note-4) BPTSFd	73.0	%
Adjustment for no-passing zones, fnp	21.9	
Percent time-spent-following, PTSFd	85.0	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.53
Peak 15-min vehicle-miles of travel, VMT15	227 veh-mi
Peak-hour vehicle-miles of travel, VMT60	836 veh-mi
Peak 15-min total travel time, TT15	7.6 veh-h
Capacity from ATS, CdATS	1688 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1688 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	29.7	mi/h
Percent time-spent-following, PTSFd (from above)	85.0	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 908.7
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 6.17
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Volvo Car Drive (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	6.0 ft	% Trucks and buses	10 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	20 %
Up/down	- %	Access point density	8 /mi

Analysis direction volume, Vd 472 veh/h
Opposing direction volume, Vo 155 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.2	1.6
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.980	0.943
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	524 pc/h	179 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 0.0 mi/h
Adj. for access point density,(note-3) fA 2.0 mi/h

Free-flow speed, FFSd	48.0	mi/h
Adjustment for no-passing zones, fnp	0.9	mi/h
Average travel speed, ATSD	41.7	mi/h
Percent Free Flow Speed, PFFS	86.8	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	0.990
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	513 pc/h	170 pc/h
Base percent time-spent-following,(note-4) BPTSFd	45.5	%
Adjustment for no-passing zones, fnp	24.8	
Percent time-spent-following, PTSFd	64.1	%

Level of Service and Other Performance Measures

Level of service, LOS	B
Volume to capacity ratio, v/c	0.31
Peak 15-min vehicle-miles of travel, VMT15	128 veh-mi
Peak-hour vehicle-miles of travel, VMT60	472 veh-mi
Peak 15-min total travel time, TT15	3.1 veh-h
Capacity from ATS, CdATS	1603 veh/h
Capacity from PTSF, CdPTSF	1683 veh/h
Directional Capacity	1603 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	41.7	mi/h
Percent time-spent-following, PTSFd (from above)	64.1	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 513.0
Effective width of outside lane, We 24.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.10
Bicycle LOS E

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 27 (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	7 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	30 /mi

Analysis direction volume, Vd 581 veh/h
Opposing direction volume, Vo 452 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.2
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.993	0.986
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	650 pc/h	509 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 7.5 mi/h

Free-flow speed, FFSd	43.3	mi/h
Adjustment for no-passing zones, fnp	2.2	mi/h
Average travel speed, ATSD	32.1	mi/h
Percent Free Flow Speed, PFFS	74.1	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	646 pc/h	502 pc/h
Base percent time-spent-following,(note-4) BPTSFd	60.3	%
Adjustment for no-passing zones, fnp	34.3	
Percent time-spent-following, PTSFd	79.6	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.38
Peak 15-min vehicle-miles of travel, VMT15	161 veh-mi
Peak-hour vehicle-miles of travel, VMT60	581 veh-mi
Peak 15-min total travel time, TT15	5.0 veh-h
Capacity from ATS, CdATS	1676 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1676 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.1	mi/h
Percent time-spent-following, PTSFd (from above)	79.6	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 645.6
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 6.13
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 27 (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	10 /mi

Analysis direction volume, Vd 504 veh/h
Opposing direction volume, Vo 414 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.2
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.993	0.986
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	564 pc/h	467 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 2.5 mi/h

Free-flow speed, FFSd	49.5	mi/h
Adjustment for no-passing zones, fnp	2.4	mi/h
Average travel speed, ATSD	39.1	mi/h
Percent Free Flow Speed, PFFS	78.9	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	560 pc/h	460 pc/h
Base percent time-spent-following,(note-4) BPTSFd	54.0	%
Adjustment for no-passing zones, fnp	38.1	
Percent time-spent-following, PTSFd	74.9	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.33
Peak 15-min vehicle-miles of travel, VMT15	140 veh-mi
Peak-hour vehicle-miles of travel, VMT60	504 veh-mi
Peak 15-min total travel time, TT15	3.6 veh-h
Capacity from ATS, CdATS	1676 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1676 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	39.1	mi/h
Percent time-spent-following, PTSFd (from above)	74.9	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 560.0
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.93
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 453 (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	24 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	75 %
Up/down	- %	Access point density	4 /mi

Analysis direction volume, Vd 180 veh/h
Opposing direction volume, Vo 156 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.5	1.6
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.893	0.874
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	224 pc/h	198 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.7 mi/h
Adj. for access point density,(note-3) fA 1.0 mi/h

Free-flow speed, FFSd	39.3	mi/h
Adjustment for no-passing zones, fnp	3.6	mi/h
Average travel speed, ATSD	32.4	mi/h
Percent Free Flow Speed, PFFS	82.5	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.977	0.977
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	205 pc/h	177 pc/h
Base percent time-spent-following,(note-4) BPTSFd	22.0	%
Adjustment for no-passing zones, fnp	59.3	
Percent time-spent-following, PTSFd	53.8	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.13
Peak 15-min vehicle-miles of travel, VMT15	50 veh-mi
Peak-hour vehicle-miles of travel, VMT60	180 veh-mi
Peak 15-min total travel time, TT15	1.5 veh-h
Capacity from ATS, CdATS	1486 veh/h
Capacity from PTSF, CdPTSF	1660 veh/h
Directional Capacity	1486 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.4	mi/h
Percent time-spent-following, PTSFd (from above)	53.8	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 200.0
Effective width of outside lane, We 12.50
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 14.42
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 453 (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	24 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	70 %
Up/down	- %	Access point density	16 /mi

Analysis direction volume, Vd 243 veh/h
Opposing direction volume, Vo 170 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.4	1.5
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.912	0.893
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	296 pc/h	212 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 4.0 mi/h

Free-flow speed, FFSd	36.8	mi/h
Adjustment for no-passing zones, fnp	3.4	mi/h
Average travel speed, ATSD	29.5	mi/h
Percent Free Flow Speed, PFFS	80.1	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.977	0.977
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	276 pc/h	193 pc/h
Base percent time-spent-following,(note-4) BPTSFd	28.3	%
Adjustment for no-passing zones, fnp	54.2	
Percent time-spent-following, PTSFd	60.2	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.17
Peak 15-min vehicle-miles of travel, VMT15	68 veh-mi
Peak-hour vehicle-miles of travel, VMT60	243 veh-mi
Peak 15-min total travel time, TT15	2.3 veh-h
Capacity from ATS, CdATS	1518 veh/h
Capacity from PTSF, CdPTSF	1660 veh/h
Directional Capacity	1518 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	29.5	mi/h
Percent time-spent-following, PTSFd (from above)	60.2	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 270.0
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 14.51
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

June 2019

C.5 2043 BUILD – ALTERNATIVE 1



HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1991	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	67	vph
Length of first accel/decel lane	465	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	171	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1991	67	171	vph
Peak-hour factor, PHF	0.91	0.95	0.90	

Peak 15-min volume, v_{15}	547	18	48	v
Trucks and buses	24	53	36	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.791	0.847	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2450	89	224	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 2450$ pc/h

$v_{12} = 2450$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	2450	4800	No
$v_{12} = v_F - v_R$	2361	4800	No
$v_{12} = v_F$	89	2000	No
$v_{12} \text{ or } v_R$	0 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_R > 2700$ pc/h?		No	
Is $v_{12} \text{ or } v_R > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 2450$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2450	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 21.1$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.436$

S

Space mean speed in ramp influence area, $S = 57.8$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 57.8 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2095	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	169	vph
Length of first accel/decel lane	250	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	670	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	4000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2095	169	670	vph
Peak-hour factor, PHF	0.91	0.90	0.90	

Peak 15-min volume, v_{15}	576	47	186	v
Trucks and buses	24	29	16	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.873	0.926	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2578	215	804	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.686$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 1835$ pc/h

$v_{12} = 1835$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	2578	7200	No
$v_{12} = v_F$			
$v_{12} = v_F - v_R$	2363	7200	No
$v_{12} = v_F - v_R$			
$v_{12} = v_R$	215	2000	No
$v_{12} = v_R$			
$v_{12} = v_F$ or $v_{12} = v_R$	743 pc/h	(Equation 13-14 or 13-17)	
$v_{12} = v_F$ or $v_{12} = v_R$			
Is $v_{12} = v_F$ or $v_{12} = v_R$ > 2700 pc/h?		No	
Is $v_{12} = v_F$ or $v_{12} = v_R$ > 1.5 $v_{12} / 2$		No	
If yes, $v_{12} = 1835$	(Equation 13-15, 13-16, 13-18, or 13-19)		
$v_{12} = 1835$			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1835	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 17.8$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.447$

S

Space mean speed in ramp influence area, $S = 57.5$ mph

R

Space mean speed in outer lanes, S = 76.8 mph

0

Space mean speed for all vehicles, S = 62.0 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2613	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	186	vph
Length of first accel/decel lane	1200	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	500	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	3500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2613	186	500	vph
Peak-hour factor, PHF	0.91	0.92	0.92	

Peak 15-min volume, v_{15}	718	51	136	v
Trucks and buses	24	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3216	212	571	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.670$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 2224$ pc/h

$v_{12} = 2224$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	3216	7200	No
$v_{12} = v_F - v_R$	3004	7200	No
$v_{12} = v_R$	212	2000	No
v_{12} or v_{12}	992 pc/h	(Equation 13-14 or 13-17)	
Is v_{12} or $v_{12} > 2700$ pc/h?		No	
Is v_{12} or $v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 2224$	(Equation 13-15, 13-16, 13-18, or 13-19)		
$v_{12} = 2224$			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2224	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 12.6$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.447$

S

Space mean speed in ramp influence area, $S = 57.5$ mph

R

Space mean speed in outer lanes, S = 76.8 mph

0

Space mean speed for all vehicles, S = 62.3 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2927	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	185	vph
Length of first accel/decel lane	180	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1105	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2900	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2927	185	1105	vph
Peak-hour factor, PHF	0.91	0.90	0.90	

Peak 15-min volume, v_{15}	804	51	307	v
Trucks and buses	24	29	11	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.873	0.948	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3602	235	1295	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.659$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 2454$ pc/h

$v_{12} = 2454$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	3602	7200	No
$v_{12} = v_F - v_R$	3367	7200	No
$v_{12} = v_R$	235	2000	No
v_{12} or v_{12}	1148 pc/h	(Equation 13-14 or 13-17)	
Is v_{12} or $v_{12} > 2700$ pc/h?		No	
Is v_{12} or $v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 2454$	(Equation 13-15, 13-16, 13-18, or 13-19)		

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2454	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 23.7$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.449$

S

Space mean speed in ramp influence area, $S = 57.4$ mph

R

Space mean speed in outer lanes, S = 76.2 mph

0

Space mean speed for all vehicles, S = 62.3 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3743	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	404	vph
Length of first accel/decel lane	850	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	193	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	750	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3743	404	193	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v_{15}	1017	112	54	v
Trucks and buses	22	10	11	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.952	0.948	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	4516	471	226	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.625$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 3001$ pc/h

$v_{12} = 3001$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	4516	7200	No
$v_{12} = v_F - v_R$	4045	7200	No
$v_{12} = v_R$	471	2000	No
$v_{12} \text{ or } v_{12}$	1515 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_{12} > 2700$ pc/h?		No	
Is $v_{12} \text{ or } v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 3001$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3001	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 22.4$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.470$

S

Space mean speed in ramp influence area, $S = 56.8$ mph

R

Space mean speed in outer lanes, S = 74.8 mph

0

Space mean speed for all vehicles, S = 61.8 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3937	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	194	vph
Length of first accel/decel lane	150	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	404	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	920	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3937	194	404	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v_{15}	1070	54	112	v
Trucks and buses	22	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	4750	226	471	pcph

Estimation of V12 Diverge Areas

$$L = 515.27 \text{ (Equation 13-12 or 13-13)}$$

EQ

$$P = 0.631 \text{ Using Equation 5}$$

FD

$$v_{12} = v_F + (v_R - v_F) P = 3080 \text{ pc/h}$$

$$v_{12} = v_F + (v_R - v_F) P$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	4750	7200	No
$v_{12} = v_F + (v_R - v_F) P$	4524	7200	No
$v_{12} = v_F + (v_R - v_F) P$	226	2000	No
$v_{12} = v_F + (v_R - v_F) P$	1670 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} > 2700 \text{ pc/h}$?	No		
Is $v_{12} > 1.5 v_{12} / 2$?	No		
If yes, $v_{12} = 3080$	(Equation 13-15, 13-16, 13-18, or 13-19)		

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3080	4400	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L = 29.4 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

$$\text{Intermediate speed variable, } D = 0.448$$

S

$$\text{Space mean speed in ramp influence area, } S = 57.4 \text{ mph}$$

R

Space mean speed in outer lanes, S = 74.2 mph

0

Space mean speed for all vehicles, S = 62.4 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3532	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	743	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane	1500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	125	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3532	743	125	vph
Peak-hour factor, PHF	0.92	0.92	0.92	

Peak 15-min volume, v_{15}	960	202	34	v
Trucks and buses	22	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	4261	848	143	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.450$ Using Equation 0

FD

$v_{12} = v_R + (v_F - v_R) P = 2384$ pc/h

$v_{12} = 2384$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_R$	4261	7200	No
$v_{12} = v_F$			
$v_{12} = v_F - v_R$	3413	7200	No
$v_{12} = v_F$			
$v_{12} = v_R$	848	4000	No
$v_{12} = v_F$			
$v_{12} = v_F$	1877 pc/h	(Equation 13-14 or 13-17)	
$v_{12} = v_F$			
Is $v_{12} > 2700$ pc/h?		No	
Is $v_{12} > 1.5 v_{12} / 2$		Yes	
If yes, $v_{12} = 2434$		(Equation 13-15, 13-16, 13-18, or 13-19)	
$v_{12} = 2434$			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
$v_{12} = 2434$	2434	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = -15.3$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable, $D = 0.504$

S

Space mean speed in ramp influence area, $S = 55.9$ mph

R

Space mean speed in outer lanes, S = 73.6 mph

0

Space mean speed for all vehicles, S = 62.3 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2914	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	514	vph
Length of first accel/decel lane	250	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	154	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	3300	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2914	514	154	vph
Peak-hour factor, PHF	0.92	0.94	0.90	

Peak 15-min volume, v_{15}	792	137	43	v
Trucks and buses	22	27	16	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.881	0.926	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3516	621	185	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.644$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 2484$ pc/h

$v_{12} = 2484$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	3516	7200	No
$v_{12} = v_F - v_R$	2895	7200	No
$v_{12} = v_F$	621	2000	No
$v_{12} \text{ or } v_{12}$	1032 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_{12} > 2700$ pc/h?		No	
Is $v_{12} \text{ or } v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 2484$	(Equation 13-15, 13-16, 13-18, or 13-19)		

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2484	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 23.4$ pc/mi/ln

$D = 23.4$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.484$

S

Space mean speed in ramp influence area, $S = 56.5$ mph

R

Space mean speed in outer lanes, S = 76.7 mph

0

Space mean speed for all vehicles, S = 61.2 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2567	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	192	vph
Length of first accel/decel lane	475	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	66	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2567	192	66	vph
Peak-hour factor, PHF	0.92	0.90	0.92	

Peak 15-min volume, v_{15}	698	53	18	v
Trucks and buses	22	46	36	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.813	0.847	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3097	262	85	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 3097$ pc/h

$v_{12} = 3097$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	3097	4800	No
$v_{12} = v_F$			
$v_{12} = v_F - v_R$	2835	4800	No
$v_{12} = v_F - v_R$			
$v_{12} = v_F$	262	2000	No
$v_{12} = v_F$			
$v_{12} = v_F$ or $v_{12} = v_R$	0 pc/h	(Equation 13-14 or 13-17)	
$v_{12} = v_F$ or $v_{12} = v_R$			
Is $v_{12} = v_F$ or $v_{12} = v_R$ > 2700 pc/h?		No	
Is $v_{12} = v_F$ or $v_{12} = v_R$ > 1.5 $v_{12} / 2$		No	
If yes, $v_{12} = 3097$		(Equation 13-15, 13-16, 13-18, or 13-19)	
$v_{12} = 3097$			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3097	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 26.6$ pc/mi/ln

$D = 26.6$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.452$

S

Space mean speed in ramp influence area, $S = 57.4$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 57.4 mph

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: West of SC 453
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1991	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	547	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	1225	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.2	mi/h
Free-flow speed, FFS	72.2	mi/h

LOS and Performance Measures

Flow rate, vp	1225	pc/h/ln
Free-flow speed, FFS	72.2	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	2	
Density, D	17.5	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Between SC 453 Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1924	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	529	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	1184	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.33	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.3	mi/h
Free-flow speed, FFS	74.1	mi/h

LOS and Performance Measures

Flow rate, vp	1184	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	74.6	mi/h
Number of lanes, N	2	
Density, D	15.9	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: SC 453 to SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2095	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	576	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	1289	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	1289	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	74.1	mi/h
Number of lanes, N	2	
Density, D	17.4	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Between SC 27 Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1926	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	529	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	790	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	790	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	10.5	pc/mi/ln
Level of service, LOS	A	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Between SC 27 & Volvo
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2613	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	718	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	1072	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1072	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	74.9	mi/h
Number of lanes, N	3	
Density, D	14.3	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Between Volvo Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2427	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	667	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	996	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	996	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	13.3	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Volvo to Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2927	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	804	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	1201	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1201	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	74.6	mi/h
Number of lanes, N	3	
Density, D	16.1	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2742	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	753	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	1125	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.50	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.8	mi/h
Free-flow speed, FFS	73.6	mi/h

LOS and Performance Measures

Flow rate, vp	1125	pc/h/ln
Free-flow speed, FFS	73.6	mi/h
Average passenger-car speed, S	74.8	mi/h
Number of lanes, N	3	
Density, D	15.0	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Jedburg to Nexton
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3847	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	1057	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	1578	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.20	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.8	mi/h
Free-flow speed, FFS	71.6	mi/h

LOS and Performance Measures

Flow rate, vp	1578	pc/h/ln
Free-flow speed, FFS	71.6	mi/h
Average passenger-car speed, S	68.3	mi/h
Number of lanes, N	3	
Density, D	23.1	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Nexton to Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3937	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1070	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1583	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.33	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	4.1	mi/h
Free-flow speed, FFS	71.3	mi/h

LOS and Performance Measures

Flow rate, vp	1583	pc/h/ln
Free-flow speed, FFS	71.3	mi/h
Average passenger-car speed, S	68.3	mi/h
Number of lanes, N	3	
Density, D	23.2	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3339	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	907	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1343	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1343	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	73.7	mi/h
Number of lanes, N	3	
Density, D	18.2	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3743	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1017	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1505	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1505	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	72.2	mi/h
Number of lanes, N	3	
Density, D	20.9	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Jedburg to Volvo
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3532	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	960	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1420	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	1420	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	73.0	mi/h
Number of lanes, N	3	
Density, D	19.4	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between Volvo Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2789	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	758	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1122	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1122	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	74.8	mi/h
Number of lanes, N	3	
Density, D	15.0	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between Volvo & SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2914	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	792	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1172	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1172	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	74.7	mi/h
Number of lanes, N	3	
Density, D	15.7	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between SC 27 Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2400	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	652	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	965	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, v_p	965	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	12.9	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: SC 27 to SC 453
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2567	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	698	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1549	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	1549	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	71.7	mi/h
Number of lanes, N	2	
Density, D	21.6	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between SC 453 Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2375	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	645	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1433	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.33	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.3	mi/h
Free-flow speed, FFS	74.1	mi/h

LOS and Performance Measures

Flow rate, vp	1433	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	72.9	mi/h
Number of lanes, N	2	
Density, D	19.7	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: West of SC 453
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2441	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	663	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1473	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.2	mi/h
Free-flow speed, FFS	72.2	mi/h

LOS and Performance Measures

Flow rate, vp	1473	pc/h/ln
Free-flow speed, FFS	72.2	mi/h
Average passenger-car speed, S	69.1	mi/h
Number of lanes, N	2	
Density, D	21.3	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1924	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	171	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	67	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1924	171	67	vph
Peak-hour factor, PHF	0.91	0.90	0.95	

Peak 15-min volume, v_{15}	529	48	18	v
Trucks and buses	24	36	53	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.847	0.791	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2368	224	89	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)

EQ

$P = 1.000$ Using Equation 0

FM

$v_{12} = v_{12} (P) = 2368$ pc/h

FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	2592	4800	No
FO			
v_{12} or v_{12}	0 pc/h	(Equation 13-14 or 13-17)	
$\frac{v_{12}}{3}$ av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
$\frac{v_{12}}{3}$ av34			
Is v_{12} or v_{12}	$> 1.5 \frac{v_{12}}{12}$	No	
$\frac{v_{12}}{3}$ av34			
If yes, v_{12}	$= 2368$	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2592	4600	No
R12			

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 \frac{v_{12}}{R} + 0.0078 \frac{v_{12}}{A} - 0.00627 L = 20.6$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $M = 0.317$

S

Space mean speed in ramp influence area, $S = 61.1$ mph

R

Space mean speed in outer lanes, $S = N/A$ mph

0

Space mean speed for all vehicles, $S = 61.1$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1926	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	687	vph
Length of first accel/decel lane	900	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	156	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	4000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
	Ramp			
Volume, V (vph)	1926	687	156	vph
Peak-hour factor, PHF	0.91	0.90	0.90	

Peak 15-min volume, v_{15}	529	191	43	v
Trucks and buses	24	20	23	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.909	0.897	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2370	840	193	pcph

Estimation of V12 Merge Areas

$$L = 514.74 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.603 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 1428 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	3210	7200	No
FO			
v_{12} or v_{12}	942 pc/h	(Equation 13-14 or 13-17)	
$\frac{v_{12}}{3}$ av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
$\frac{v_{12}}{3}$ av34			
Is v_{12} or v_{12}	> 1.5 $v_{12} / 2$	Yes	
$\frac{v_{12}}{3}$ av34	12		
If yes, v_{12}	= 1428	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2268	4600	No
12A			

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 17.1 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.296$

S

Space mean speed in ramp influence area, $S = 61.7$ mph

R

Space mean speed in outer lanes, $S = 68.4$ mph

0

Space mean speed for all vehicles, $S = 63.5$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2427	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-flow speed on ramp	35.0	mph
Volume on ramp	500	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane	1500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	186	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	3500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2427	500	186	vph
Peak-hour factor, PHF	0.91	0.92	0.92	

Peak 15-min volume, v_{15}	667	136	51	v
Trucks and buses	24	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2987	571	212	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)

EQ

$P = 0.555$ Using Equation 0

FM

$v_{12} = v_{12} (P) = 1658$ pc/h

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	3558	7200	No
FO			
v_{12} or v_{12}	1329 pc/h	(Equation 13-14 or 13-17)	
3 av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
3 av34			
Is v_{12} or v_{12}	> 1.5 $v_{12} / 2$	Yes	
3 av34	12		
If yes, v_{12}	= 1706	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2277	4600	No
12A			

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = -5.2$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable, $M = 0.044$

S

Space mean speed in ramp influence area, $S = 68.8$ mph

R

Space mean speed in outer lanes, $S = 67.2$ mph

0

Space mean speed for all vehicles, $S = 68.2$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2742	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	1105	vph
Length of first accel/decel lane	1120	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	185	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1900	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2742	1105	185	vph
Peak-hour factor, PHF	0.91	0.90	0.90	

Peak 15-min volume, v_{15}	753	307	51	v
Trucks and buses	24	11	29	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.948	0.873	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3375	1295	235	pcph

Estimation of V12 Merge Areas

$$L = 924.86 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.609 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 2055 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	4670	7200	No
FO			
v_{12} or v_{12}	1320 pc/h	(Equation 13-14 or 13-17)	
$\frac{v_{12}}{3}$ av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
$\frac{v_{12}}{3}$ av34			
Is v_{12} or v_{12}	> 1.5 $v_{12} / 2$	Yes	
$\frac{v_{12}}{3}$ av34	12		
If yes, v_{12}	= 2055	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3350	4600	No
12A			

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 24.0 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

$$\text{Intermediate speed variable, } M = 0.354$$

S

$$\text{Space mean speed in ramp influence area, } S_R = 60.1 \text{ mph}$$

R

$$\text{Space mean speed in outer lanes, } S_O = 67.0 \text{ mph}$$

O

$$\text{Space mean speed for all vehicles, } S_A = 61.9 \text{ mph}$$

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3339	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	193	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	404	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	750	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3339	193	404	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v_{15}	907	54	112	v
Trucks and buses	22	11	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.948	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	4029	226	471	pcph

Estimation of V12 Merge Areas

$$L = 1004.77 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.603 \text{ Using Equation 2}$$

FM

$$v_{12} = v_{12} (P) = 2431 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	4255	7200	No
FO			
v_{12} or v_{12}	1598 pc/h	(Equation 13-14 or 13-17)	
v_{12} or v_{12}			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
v_{12} or v_{12}			
Is v_{12} or v_{12}	> 1.5 v_{12} / 2	Yes	
v_{12} or v_{12}			
If yes, v_{12}	= 2431	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2657	4600	No
12A			

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 16.7 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.272$

S

Space mean speed in ramp influence area, $S = 62.4 \text{ mph}$

R

Space mean speed in outer lanes, $S = 66.0 \text{ mph}$

0

Space mean speed for all vehicles, $S = 63.7 \text{ mph}$

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2789	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	125	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	743	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2789	125	743	vph
Peak-hour factor, PHF	0.92	0.92	0.92	

Peak 15-min volume, v_{15}	758	34	202	v
Trucks and buses	22	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3365	143	848	pcph

Estimation of V12 Merge Areas

$$L = 844.91 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.619 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 2085 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	3508	7200	No
FO			
v_{12} or v_{12}	1280 pc/h	(Equation 13-14 or 13-17)	
3 av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
3 av34			
Is v_{12} or v_{12}	> 1.5 $v_{12} / 2$	Yes	
3 av34	12		
If yes, v_{12}	= 2085	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2228	4600	No
12A			

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 13.4 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.252$

S

Space mean speed in ramp influence area, $S = 62.9$ mph

R

Space mean speed in outer lanes, $S = 67.2$ mph

0

Space mean speed for all vehicles, $S = 64.4$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2400	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	167	vph
Length of first accel/decel lane	900	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	497	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	3300	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2400	167	497	vph
Peak-hour factor, PHF	0.92	0.90	0.94	

Peak 15-min volume, v_{15}	652	46	132	v
Trucks and buses	22	25	25	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.889	0.889	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2896	209	595	pcph

Estimation of V12 Merge Areas

$L = 492.27$ (Equation 13-6 or 13-7)

EQ

$P = 0.603$ Using Equation 1

FM

$v_{12} = v_{FM} (P) = 1745$ pc/h

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3105	7200	No
v_3 or v_{av34}	1151 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700$ pc/h?		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		Yes	
If yes, $v_{12A} = 1745$	(Equation 13-15, 13-16, 13-18, or 13-19)		
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	1954	4600	No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_A - 0.00627 L = 15.0$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.286$

S

Space mean speed in ramp influence area, $S_R = 62.0$ mph

R

Space mean speed in outer lanes, $S_0 = 67.7$ mph

0

Space mean speed for all vehicles, $S = 64.0$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2375	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	66	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	192	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2375	66	192	vph
Peak-hour factor, PHF	0.92	0.92	0.90	

Peak 15-min volume, v ₁₅	645	18	53	v
Trucks and buses	22	36	46	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.901	0.847	0.813	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	2865	85	262	pcph

Estimation of V₁₂ Merge Areas

L = (Equation 13-6 or 13-7)

EQ

P = 1.000 Using Equation 0

FM

v = v₁₂ (P) = 2865 pc/h

FM

Capacity Checks

	Actual	Maximum	LOS F?
v	2950	4800	No
FO			
v or v ₃	0 pc/h	(Equation 13-14 or 13-17)	
av ₃₄			
Is v or v ₃	> 2700 pc/h?	No	
av ₃₄			
Is v or v ₃	> 1.5 v ₁₂ / 2	No	
av ₃₄			
If yes, v _{12A}	= 2865	(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v	2950	4600	No
R ₁₂			

Level of Service Determination (if not F)

Density, D = $5.475 + 0.00734 v_R + 0.0078 v_A - 0.00627 L$ = 23.4 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, M = 0.340

S

Space mean speed in ramp influence area, S = 60.5 mph

R

Space mean speed in outer lanes, S = N/A mph

0

Space mean speed for all vehicles, S = 60.5 mph

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Jedburg Road (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.93
Shoulder width	2.5 ft	% Trucks and buses	11 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 451 veh/h
Opposing direction volume, Vo 719 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.2	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.978	0.989
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	496 pc/h	782 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	1.3	mi/h
Average travel speed, ATSD	32.3	mi/h
Percent Free Flow Speed, PFFS	74.3	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	485 pc/h	773 pc/h
Base percent time-spent-following,(note-4) BPTSFd	53.5	%
Adjustment for no-passing zones, fnp	29.9	
Percent time-spent-following, PTSFd	65.0	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.29
Peak 15-min vehicle-miles of travel, VMT15	121 veh-mi
Peak-hour vehicle-miles of travel, VMT60	451 veh-mi
Peak 15-min total travel time, TT15	3.7 veh-h
Capacity from ATS, CdATS	1681 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1681 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.3	mi/h
Percent time-spent-following, PTSFd (from above)	65.0	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 484.9
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 7.39
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Jedburg Road (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.94
Shoulder width	2.5 ft	% Trucks and buses	11 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	60 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 994 veh/h
Opposing direction volume, Vo 683 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	1.000	0.989
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	1057 pc/h	735 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	1.0	mi/h
Average travel speed, ATSD	28.6	mi/h
Percent Free Flow Speed, PFFS	65.8	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	1057 pc/h	727 pc/h
Base percent time-spent-following,(note-4) BPTSFd	77.5	%
Adjustment for no-passing zones, fnp	19.5	
Percent time-spent-following, PTSFd	89.1	%

Level of Service and Other Performance Measures

Level of service, LOS	E
Volume to capacity ratio, v/c	0.62
Peak 15-min vehicle-miles of travel, VMT15	264 veh-mi
Peak-hour vehicle-miles of travel, VMT60	994 veh-mi
Peak 15-min total travel time, TT15	9.2 veh-h
Capacity from ATS, CdATS	1681 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1681 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	28.6	mi/h
Percent time-spent-following, PTSFd (from above)	89.1	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 1057.4
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 7.79
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Volvo Car Drive (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	6.0 ft	% Trucks and buses	10 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	20 %
Up/down	- %	Access point density	8 /mi

Analysis direction volume, Vd 928 veh/h
Opposing direction volume, Vo 625 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	1.000	0.990
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	1009 pc/h	686 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 0.0 mi/h
Adj. for access point density,(note-3) fA 2.0 mi/h

Free-flow speed, FFSd	48.0	mi/h
Adjustment for no-passing zones, fnp	0.5	mi/h
Average travel speed, ATSD	34.4	mi/h
Percent Free Flow Speed, PFFS	71.7	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	1009 pc/h	679 pc/h
Base percent time-spent-following,(note-4) BPTSFd	75.5	%
Adjustment for no-passing zones, fnp	16.3	
Percent time-spent-following, PTSFd	85.2	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.59
Peak 15-min vehicle-miles of travel, VMT15	252 veh-mi
Peak-hour vehicle-miles of travel, VMT60	928 veh-mi
Peak 15-min total travel time, TT15	7.3 veh-h
Capacity from ATS, CdATS	1683 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1683 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	34.4	mi/h
Percent time-spent-following, PTSFd (from above)	85.2	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 1008.7
Effective width of outside lane, We 24.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.45
Bicycle LOS E

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 27 (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.93
Shoulder width	1.0 ft	% Trucks and buses	16 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	30 /mi

Analysis direction volume, Vd 549 veh/h
Opposing direction volume, Vo 500 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.2
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.984	0.969
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	600 pc/h	555 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 7.5 mi/h

Free-flow speed, FFSd	43.3	mi/h
Adjustment for no-passing zones, fnp	2.0	mi/h
Average travel speed, ATSD	32.3	mi/h
Percent Free Flow Speed, PFFS	74.7	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	590 pc/h	538 pc/h
Base percent time-spent-following,(note-4) BPTSFd	57.5	%
Adjustment for no-passing zones, fnp	36.0	
Percent time-spent-following, PTSFd	76.3	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.35
Peak 15-min vehicle-miles of travel, VMT15	148 veh-mi
Peak-hour vehicle-miles of travel, VMT60	549 veh-mi
Peak 15-min total travel time, TT15	4.6 veh-h
Capacity from ATS, CdATS	1647 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1647 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.3	mi/h
Percent time-spent-following, PTSFd (from above)	76.3	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 590.3
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 10.01
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 27 (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.91
Shoulder width	2.5 ft	% Trucks and buses	16 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	10 /mi

Analysis direction volume, Vd 695 veh/h
Opposing direction volume, Vo 480 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.2
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.984	0.969
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	776 pc/h	544 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 2.5 mi/h

Free-flow speed, FFSd	49.5	mi/h
Adjustment for no-passing zones, fnp	2.1	mi/h
Average travel speed, ATSD	37.1	mi/h
Percent Free Flow Speed, PFFS	75.0	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	764 pc/h	527 pc/h
Base percent time-spent-following,(note-4) BPTSFd	65.4	%
Adjustment for no-passing zones, fnp	30.0	
Percent time-spent-following, PTSFd	83.2	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.46
Peak 15-min vehicle-miles of travel, VMT15	191 veh-mi
Peak-hour vehicle-miles of travel, VMT60	695 veh-mi
Peak 15-min total travel time, TT15	5.1 veh-h
Capacity from ATS, CdATS	1647 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1647 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	37.1	mi/h
Percent time-spent-following, PTSFd (from above)	83.2	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 763.7
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 10.01
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 453 (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	1.0 ft	% Trucks and buses	36 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	75 %
Up/down	- %	Access point density	4 /mi

Analysis direction volume, Vd 234 veh/h
Opposing direction volume, Vo 151 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.4	1.6
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.874	0.822
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	291 pc/h	200 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.7 mi/h
Adj. for access point density,(note-3) fA 1.0 mi/h

Free-flow speed, FFSd	39.3	mi/h
Adjustment for no-passing zones, fnp	3.6	mi/h
Average travel speed, ATSD	31.9	mi/h
Percent Free Flow Speed, PFFS	81.1	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.965	0.965
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	264 pc/h	170 pc/h
Base percent time-spent-following,(note-4) BPTSFd	27.2	%
Adjustment for no-passing zones, fnp	53.7	
Percent time-spent-following, PTSFd	59.9	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.17
Peak 15-min vehicle-miles of travel, VMT15	64 veh-mi
Peak-hour vehicle-miles of travel, VMT60	234 veh-mi
Peak 15-min total travel time, TT15	2.0 veh-h
Capacity from ATS, CdATS	1397 veh/h
Capacity from PTSF, CdPTSF	1641 veh/h
Directional Capacity	1397 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	31.9	mi/h
Percent time-spent-following, PTSFd (from above)	59.9	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 254.3
Effective width of outside lane, We 12.50
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 24.36
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 453 (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	36 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	70 %
Up/down	- %	Access point density	16 /mi

Analysis direction volume, Vd 227 veh/h
Opposing direction volume, Vo 190 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.4	1.5
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.874	0.847
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	289 pc/h	249 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 4.0 mi/h

Free-flow speed, FFSd	36.8	mi/h
Adjustment for no-passing zones, fnp	3.2	mi/h
Average travel speed, ATSD	29.5	mi/h
Percent Free Flow Speed, PFFS	80.1	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.965	0.965
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	261 pc/h	219 pc/h
Base percent time-spent-following,(note-4) BPTSFd	27.9	%
Adjustment for no-passing zones, fnp	56.6	
Percent time-spent-following, PTSFd	58.7	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.17
Peak 15-min vehicle-miles of travel, VMT15	63 veh-mi
Peak-hour vehicle-miles of travel, VMT60	227 veh-mi
Peak 15-min total travel time, TT15	2.1 veh-h
Capacity from ATS, CdATS	1440 veh/h
Capacity from PTSF, CdPTSF	1641 veh/h
Directional Capacity	1440 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	29.5	mi/h
Percent time-spent-following, PTSFd (from above)	58.7	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 252.2
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 24.29
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Jedburg Road (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.93
Shoulder width	2.5 ft	% Trucks and buses	11 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 719 veh/h
Opposing direction volume, Vo 451 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.2
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.989	0.978
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	782 pc/h	496 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	2.3	mi/h
Average travel speed, ATSD	31.3	mi/h
Percent Free Flow Speed, PFFS	72.0	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	773 pc/h	485 pc/h
Base percent time-spent-following,(note-4) BPTSFd	65.8	%
Adjustment for no-passing zones, fnp	29.9	
Percent time-spent-following, PTSFd	84.2	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.46
Peak 15-min vehicle-miles of travel, VMT15	193 veh-mi
Peak-hour vehicle-miles of travel, VMT60	719 veh-mi
Peak 15-min total travel time, TT15	6.2 veh-h
Capacity from ATS, CdATS	1663 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1663 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	31.3	mi/h
Percent time-spent-following, PTSFd (from above)	84.2	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 773.1
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 7.63
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Jedburg Road (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.94
Shoulder width	2.5 ft	% Trucks and buses	11 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	60 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 683 veh/h
Opposing direction volume, Vo 994 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.989	1.000
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	735 pc/h	1057 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	0.6	mi/h
Average travel speed, ATSD	29.0	mi/h
Percent Free Flow Speed, PFFS	66.7	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	727 pc/h	1057 pc/h
Base percent time-spent-following,(note-4) BPTSFd	69.0	%
Adjustment for no-passing zones, fnp	19.5	
Percent time-spent-following, PTSFd	76.9	%

Level of Service and Other Performance Measures

Level of service, LOS	E
Volume to capacity ratio, v/c	0.43
Peak 15-min vehicle-miles of travel, VMT15	182 veh-mi
Peak-hour vehicle-miles of travel, VMT60	683 veh-mi
Peak 15-min total travel time, TT15	6.3 veh-h
Capacity from ATS, CdATS	1700 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1700 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	29.0	mi/h
Percent time-spent-following, PTSFd (from above)	76.9	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 726.6
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 7.60
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Volvo Car Drive (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	6.0 ft	% Trucks and buses	10 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	20 %
Up/down	- %	Access point density	8 /mi

Analysis direction volume, Vd 625 veh/h
Opposing direction volume, Vo 928 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.990	1.000
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	686 pc/h	1009 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 0.0 mi/h
Adj. for access point density,(note-3) fA 2.0 mi/h

Free-flow speed, FFSd	48.0	mi/h
Adjustment for no-passing zones, fnp	0.4	mi/h
Average travel speed, ATSD	34.5	mi/h
Percent Free Flow Speed, PFFS	71.8	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	679 pc/h	1009 pc/h
Base percent time-spent-following,(note-4) BPTSFd	66.4	%
Adjustment for no-passing zones, fnp	16.3	
Percent time-spent-following, PTSFd	73.0	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.40
Peak 15-min vehicle-miles of travel, VMT15	170 veh-mi
Peak-hour vehicle-miles of travel, VMT60	625 veh-mi
Peak 15-min total travel time, TT15	4.9 veh-h
Capacity from ATS, CdATS	1700 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1700 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	34.5	mi/h
Percent time-spent-following, PTSFd (from above)	73.0	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 679.3
Effective width of outside lane, We 24.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.25
Bicycle LOS E

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 27 (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.93
Shoulder width	1.0 ft	% Trucks and buses	16 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	30 /mi

Analysis direction volume, Vd 500 veh/h
Opposing direction volume, Vo 549 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.2	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.969	0.984
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	555 pc/h	600 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 7.5 mi/h

Free-flow speed, FFSd	43.3	mi/h
Adjustment for no-passing zones, fnp	1.8	mi/h
Average travel speed, ATSD	32.5	mi/h
Percent Free Flow Speed, PFFS	75.1	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	538 pc/h	590 pc/h
Base percent time-spent-following,(note-4) BPTSFd	53.9	%
Adjustment for no-passing zones, fnp	36.0	
Percent time-spent-following, PTSFd	71.1	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.33
Peak 15-min vehicle-miles of travel, VMT15	134 veh-mi
Peak-hour vehicle-miles of travel, VMT60	500 veh-mi
Peak 15-min total travel time, TT15	4.1 veh-h
Capacity from ATS, CdATS	1673 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1673 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.5	mi/h
Percent time-spent-following, PTSFd (from above)	71.1	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 537.6
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 9.97
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 27 (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.91
Shoulder width	2.5 ft	% Trucks and buses	16 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	10 /mi

Analysis direction volume, Vd 480 veh/h
Opposing direction volume, Vo 695 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.2	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.969	0.984
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	544 pc/h	776 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 2.5 mi/h

Free-flow speed, FFSd	49.5	mi/h
Adjustment for no-passing zones, fnp	1.4	mi/h
Average travel speed, ATSD	37.9	mi/h
Percent Free Flow Speed, PFFS	76.6	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	527 pc/h	764 pc/h
Base percent time-spent-following,(note-4) BPTSFd	56.5	%
Adjustment for no-passing zones, fnp	30.0	
Percent time-spent-following, PTSFd	68.7	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.32
Peak 15-min vehicle-miles of travel, VMT15	132 veh-mi
Peak-hour vehicle-miles of travel, VMT60	480 veh-mi
Peak 15-min total travel time, TT15	3.5 veh-h
Capacity from ATS, CdATS	1673 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1673 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	37.9	mi/h
Percent time-spent-following, PTSFd (from above)	68.7	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 527.5
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 9.82
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 453 (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	1.0 ft	% Trucks and buses	36 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	75 %
Up/down	- %	Access point density	4 /mi

Analysis direction volume, Vd 151 veh/h
Opposing direction volume, Vo 234 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.6	1.4
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.822	0.874
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	200 pc/h	291 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.7 mi/h
Adj. for access point density,(note-3) fA 1.0 mi/h

Free-flow speed, FFSd	39.3	mi/h
Adjustment for no-passing zones, fnp	3.1	mi/h
Average travel speed, ATSD	32.4	mi/h
Percent Free Flow Speed, PFFS	82.5	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.965	0.965
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	170 pc/h	264 pc/h
Base percent time-spent-following,(note-4) BPTSFd	20.7	%
Adjustment for no-passing zones, fnp	53.7	
Percent time-spent-following, PTSFd	41.7	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.12
Peak 15-min vehicle-miles of travel, VMT15	41 veh-mi
Peak-hour vehicle-miles of travel, VMT60	151 veh-mi
Peak 15-min total travel time, TT15	1.3 veh-h
Capacity from ATS, CdATS	1486 veh/h
Capacity from PTSF, CdPTSF	1641 veh/h
Directional Capacity	1486 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.4	mi/h
Percent time-spent-following, PTSFd (from above)	41.7	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 164.1
Effective width of outside lane, We 15.56
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 23.71
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 453 (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	36 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	70 %
Up/down	- %	Access point density	16 /mi

Analysis direction volume, Vd 190 veh/h
Opposing direction volume, Vo 227 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.5	1.4
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.847	0.874
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	249 pc/h	289 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 4.0 mi/h

Free-flow speed, FFSd	36.8	mi/h
Adjustment for no-passing zones, fnp	2.9	mi/h
Average travel speed, ATSD	29.7	mi/h
Percent Free Flow Speed, PFFS	80.7	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.965	0.965
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	219 pc/h	261 pc/h
Base percent time-spent-following,(note-4) BPTSFd	24.4	%
Adjustment for no-passing zones, fnp	56.6	
Percent time-spent-following, PTSFd	50.2	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.15
Peak 15-min vehicle-miles of travel, VMT15	53 veh-mi
Peak-hour vehicle-miles of travel, VMT60	190 veh-mi
Peak 15-min total travel time, TT15	1.8 veh-h
Capacity from ATS, CdATS	1486 veh/h
Capacity from PTSF, CdPTSF	1641 veh/h
Directional Capacity	1486 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	29.7	mi/h
Percent time-spent-following, PTSFd (from above)	50.2	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 211.1
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 24.20
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2617	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	37	vph
Length of first accel/decel lane	465	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	194	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2617	37	194	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v_{15}	711	10	54	v
Trucks and buses	10	52	24	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.794	0.893	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2987	52	241	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 2987$ pc/h

$v_{12} = 2987$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	2987	4800	No
$v_{12} = v_F + (v_R - v_F) P$	2935	4800	No
$v_{12} = v_F + (v_R - v_F) P$	52	2000	No
$v_{12} = v_F + (v_R - v_F) P$	0 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} > 2700$ pc/h?		No	
Is $v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 2987$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2987	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 25.8$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.433$

S

Space mean speed in ramp influence area, $S = 57.9$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 57.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2774	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	191	vph
Length of first accel/decel lane	250	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	686	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	4000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2774	191	686	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v_{15}	754	53	191	v
Trucks and buses	10	14	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.935	0.966	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3166	227	789	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.670$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 2197$ pc/h

$v_{12} = 2197$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	3166	7200	No
$v_{12} = v_F - v_R$	2939	7200	No
$v_{12} = v_R$	227	2000	No
$v_{12} \text{ or } v_{12}$	969 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_{12} > 2700$ pc/h?		No	
Is $v_{12} \text{ or } v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 2197$	(Equation 13-15, 13-16, 13-18, or 13-19)		

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2197	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 20.9$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.448$

S

Space mean speed in ramp influence area, $S = 57.4$ mph

R

Space mean speed in outer lanes, S = 76.8 mph

0

Space mean speed for all vehicles, S = 62.2 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3286	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	86	vph
Length of first accel/decel lane	1200	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	623	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	3500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3286	86	623	vph
Peak-hour factor, PHF	0.92	0.92	0.92	

Peak 15-min volume, v_{15}	893	23	169	v
Trucks and buses	10	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3750	98	711	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.662$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 2515$ pc/h

$v_{12} = 2515$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	3750	7200	No
$v_{12} = v_F - v_R$	3652	7200	No
$v_{12} = v_F$	98	2000	No
$v_{12} = v_F$	1235 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} > 2700$ pc/h?	No		
Is $v_{12} > 1.5 v_{12} / 2$	No		
If yes, $v_{12} = 2515$	(Equation 13-15, 13-16, 13-18, or 13-19)		

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2515	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 15.1$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.437$

S

Space mean speed in ramp influence area, $S = 57.8$ mph

R

Space mean speed in outer lanes, S = 75.9 mph

0

Space mean speed for all vehicles, S = 62.7 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3823	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	202	vph
Length of first accel/decel lane	180	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	824	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2900	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3823	202	824	vph
Peak-hour factor, PHF	0.92	0.91	0.90	

Peak 15-min volume, v_{15}	1039	55	229	v
Trucks and buses	10	19	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.913	0.966	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	4363	243	948	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.640$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 2879$ pc/h

$v_{12} = 2879$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	4363	7200	No
$v_{12} = v_F - v_R$	4120	7200	No
$v_{12} = v_R$	243	2000	No
v_{12} or v_{12}	1484 pc/h	(Equation 13-14 or 13-17)	
v_{12} or v_{12}	> 2700 pc/h?	No	
v_{12} or v_{12}	$> 1.5 v_{12} / 2$	No	
If yes, $v_{12} = 2879$	(Equation 13-15, 13-16, 13-18, or 13-19)		

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2879	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 27.4$ pc/mi/ln

$D = 27.4$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.450$

S

Space mean speed in ramp influence area, $S = 57.4$ mph

R

Space mean speed in outer lanes, S = 74.9 mph

0

Space mean speed for all vehicles, S = 62.4 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	4832	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	802	vph
Length of first accel/decel lane	850	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	198	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	750	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	4832	802	198	vph
Peak-hour factor, PHF	0.93	0.95	0.90	

Peak 15-min volume, v_{15}	1299	211	55	v
Trucks and buses	15	6	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.971	0.966	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	5585	870	228	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.580$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 3606$ pc/h

$v_{12} = 3606$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	5585	7200	No
$v_{12} = v_F - v_R$	4715	7200	No
$v_{12} = v_R$	870	2000	No
v_{12} or v_{12}	1979 pc/h	(Equation 13-14 or 13-17)	
Is v_{12} or $v_{12} > 2700$ pc/h?		No	
Is v_{12} or $v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 3606$	(Equation 13-15, 13-16, 13-18, or 13-19)		
$v_{12} = 3606$			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3606	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 27.6$ pc/mi/ln

$D = 27.6$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.506$

S

Space mean speed in ramp influence area, $S = 55.8$ mph

R

Space mean speed in outer lanes, S = 73.0 mph

0

Space mean speed for all vehicles, S = 60.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	5187	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	355	vph
Length of first accel/decel lane	150	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	802	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	920	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	5187	355	802	vph
Peak-hour factor, PHF	0.93	0.95	0.95	

Peak 15-min volume, v_{15}	1394	93	211	v
Trucks and buses	15	6	6	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	5996	385	870	pcph

Estimation of V12 Diverge Areas

$$L = 1066.96 \text{ (Equation 13-12 or 13-13)}$$

EQ

$$P = 0.607 \text{ Using Equation 7}$$

FD

$$v_{12} = v_F + (v_R - v_F) P = 3793 \text{ pc/h}$$

12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	5996	7200	No
$v_{12} = v_F - v_R$	5611	7200	No
$v_{12} = v_R$	385	2000	No
$v_{12} \text{ or } v_{12}$	2203 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_{12} > 2700 \text{ pc/h?}$		No	
Is $v_{12} \text{ or } v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 3793$	(Equation 13-15, 13-16, 13-18, or 13-19)		
12A			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3793	4400	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L = 35.5 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence E

Speed Estimation

$$\text{Intermediate speed variable, } D = 0.463$$

S

$$\text{Space mean speed in ramp influence area, } S = 57.0 \text{ mph}$$

R

Space mean speed in outer lanes, S = 72.1 mph

0

Space mean speed for all vehicles, S = 61.8 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	4228	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	347	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane	1500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	156	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	4228	347	156	vph
Peak-hour factor, PHF	0.93	0.92	0.92	

Peak 15-min volume, v_{15}	1137	94	42	v
Trucks and buses	15	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	4887	396	178	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.450$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 2417$ pc/h

$12 \quad R \quad F \quad R \quad FD$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	4887	7200	No
$F_i \quad F$			
$v_{12} = v_F - v_R$	4491	7200	No
$FO \quad F \quad R$			
v_R	396	4000	No
R			
v_{12} or v_{12}	2470 pc/h	(Equation 13-14 or 13-17)	
$3 \quad av_{34}$			
Is v_{12} or $v_{12} > 2700$ pc/h?		No	
$3 \quad av_{34}$			
Is v_{12} or $v_{12} > 1.5 v_{12} / 2$		Yes	
$3 \quad av_{34} \quad 12$			
If yes, $v_{12} = 2792$		(Equation 13-15, 13-16, 13-18, or 13-19)	
$12A$			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2792	4400	No
$12A$			

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = -12.2$ pc/mi/ln

$R \quad 12 \quad D$

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable, $D = 0.464$

S

Space mean speed in ramp influence area, $S = 57.0$ mph

R

Space mean speed in outer lanes, S = 72.5 mph

0

Space mean speed for all vehicles, S = 62.8 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	4037	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	689	vph
Length of first accel/decel lane	250	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	205	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	3300	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	4037	689	205	vph
Peak-hour factor, PHF	0.93	0.91	0.90	

Peak 15-min volume, v_{15}	1085	189	57	v
Trucks and buses	15	10	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.952	0.966	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	4666	795	236	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.607$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 3144$ pc/h

$v_{12} = 3144$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	4666	7200	No
$v_{12} = v_F - v_R$	3871	7200	No
$v_{12} = v_R$	795	2000	No
$v_{12} \text{ or } v_{12}$	1522 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_{12} > 2700$ pc/h?		No	
Is $v_{12} \text{ or } v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 3144$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3144	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 29.0$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable, $D = 0.500$

S

Space mean speed in ramp influence area, $S = 56.0$ mph

R

Space mean speed in outer lanes, S = 74.8 mph

0

Space mean speed for all vehicles, S = 61.0 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3566	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	198	vph
Length of first accel/decel lane	475	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	69	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3566	198	69	vph
Peak-hour factor, PHF	0.93	0.90	0.90	

Peak 15-min volume, v_{15}	959	55	19	v
Trucks and buses	15	21	24	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.905	0.893	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	4122	243	86	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 4122$ pc/h

$v_{12} = 4122$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	4122	4800	No
$v_{12} = v_F - v_R$	3879	4800	No
$v_{12} = v_F$	243	2000	No
$v_{12} \text{ or } v_R$	0 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_R > 2700$ pc/h?		No	
Is $v_{12} \text{ or } v_R > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 4122$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	4122	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 35.4$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence E

Speed Estimation

Intermediate speed variable, $D = 0.450$

S

Space mean speed in ramp influence area, $S = 57.4$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 57.4 mph

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Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: West of SC 453
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2617	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	711	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1493	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.2	mi/h
Free-flow speed, FFS	72.2	mi/h

LOS and Performance Measures

Flow rate, vp	1493	pc/h/ln
Free-flow speed, FFS	72.2	mi/h
Average passenger-car speed, S	69.0	mi/h
Number of lanes, N	2	
Density, D	21.6	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

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Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Between SC 453 Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2580	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	701	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1472	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.33	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.3	mi/h
Free-flow speed, FFS	74.1	mi/h

LOS and Performance Measures

Flow rate, vp	1472	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	72.5	mi/h
Number of lanes, N	2	
Density, D	20.3	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: SC 453 to SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2774	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	754	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1583	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	1583	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	71.2	mi/h
Number of lanes, N	2	
Density, D	22.2	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Between SC 27 Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2583	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	702	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	983	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	983	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	13.1	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Between SC 27 & Volvo
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3286	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	893	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1250	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1250	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	74.3	mi/h
Number of lanes, N	3	
Density, D	16.8	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Between Volvo Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3200	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	870	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1217	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1217	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	74.5	mi/h
Number of lanes, N	3	
Density, D	16.3	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Volvo to Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3823	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1039	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1454	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1454	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	72.7	mi/h
Number of lanes, N	3	
Density, D	20.0	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

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E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3621	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	984	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1378	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.50	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.8	mi/h
Free-flow speed, FFS	73.6	mi/h

LOS and Performance Measures

Flow rate, vp	1378	pc/h/ln
Free-flow speed, FFS	73.6	mi/h
Average passenger-car speed, S	73.4	mi/h
Number of lanes, N	3	
Density, D	18.8	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Jedburg to Nexton
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	4445	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1208	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1691	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.20	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.8	mi/h
Free-flow speed, FFS	71.6	mi/h

LOS and Performance Measures

Flow rate, vp	1691	pc/h/ln
Free-flow speed, FFS	71.6	mi/h
Average passenger-car speed, S	67.2	mi/h
Number of lanes, N	3	
Density, D	25.2	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Nexton to Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	5187	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	1394	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1999	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.33	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	4.1	mi/h
Free-flow speed, FFS	71.3	mi/h

LOS and Performance Measures

Flow rate, vp	1999	pc/h/ln
Free-flow speed, FFS	71.3	mi/h
Average passenger-car speed, S	62.6	mi/h
Number of lanes, N	3	
Density, D	31.9	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	4030	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	1083	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1553	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1553	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	71.6	mi/h
Number of lanes, N	3	
Density, D	21.7	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	4832	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	1299	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1862	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1862	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	66.8	mi/h
Number of lanes, N	3	
Density, D	27.9	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Jedburg to Volvo
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	4228	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	1137	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1629	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	1629	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	70.6	mi/h
Number of lanes, N	3	
Density, D	23.1	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between Volvo Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3881	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	1043	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1495	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1495	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	72.3	mi/h
Number of lanes, N	3	
Density, D	20.7	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between Volvo & SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	4037	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	1085	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1555	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1555	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	71.6	mi/h
Number of lanes, N	3	
Density, D	21.7	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between SC 27 Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3348	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	900	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1290	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1290	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	74.1	mi/h
Number of lanes, N	3	
Density, D	17.4	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: SC 27 to SC 453
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3566	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	959	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	2061	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	2061	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	62.5	mi/h
Number of lanes, N	2	
Density, D	33.0	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between SC 453 Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3368	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	905	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1947	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.33	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.3	mi/h
Free-flow speed, FFS	74.1	mi/h

LOS and Performance Measures

Flow rate, vp	1947	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	65.1	mi/h
Number of lanes, N	2	
Density, D	29.9	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: West of SC 453
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3437	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	924	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1986	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.2	mi/h
Free-flow speed, FFS	72.2	mi/h

LOS and Performance Measures

Flow rate, vp	1986	pc/h/ln
Free-flow speed, FFS	72.2	mi/h
Average passenger-car speed, S	62.8	mi/h
Number of lanes, N	2	
Density, D	31.6	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2580	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	194	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	37	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2580	194	37	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v_{15}	701	54	10	v
Trucks and buses	10	24	52	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.893	0.794	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2945	241	52	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)

EQ

$P = 1.000$ Using Equation 0

FM

$v_{12} = v_{12} (P) = 2945$ pc/h

FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	3186	4800	No
FO			
v_{12} or v_{12}	0 pc/h	(Equation 13-14 or 13-17)	
$\frac{v_{12}}{3}$ av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
$\frac{v_{12}}{3}$ av34			
Is v_{12} or v_{12}	$> 1.5 \frac{v_{12}}{12}$	No	
$\frac{v_{12}}{3}$ av34			
If yes, v_{12}	$= 2945$	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3186	4600	No
R12			

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 \frac{v_{12}}{R} + 0.0078 \frac{v_{12}}{A} - 0.00627 L = 25.2$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $M = 0.359$

S

Space mean speed in ramp influence area, $S = 59.9$ mph

R

Space mean speed in outer lanes, $S = N/A$ mph

0

Space mean speed for all vehicles, $S = 59.9$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2583	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	703	vph
Length of first accel/decel lane	900	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	178	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	4000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2583	703	178	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v ₁₅	702	195	49	v
Trucks and buses	10	9	8	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.952	0.957	0.962	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	2948	816	206	pcph

Estimation of V₁₂ Merge Areas

$$L = 633.30 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.603 \text{ Using Equation 1}$$

FM

$$v = v(P) = 1777 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v	3764	7200	No
FO			
v or v ₃	1171 pc/h	(Equation 13-14 or 13-17)	
av ₃₄			
Is v or v ₃	> 2700 pc/h?	No	
av ₃₄			
Is v or v ₃	> 1.5 v / 2	Yes	
av ₃₄	12		
If yes, v _{12A}	= 1777	(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v	2593	4600	No
12A			

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_R + 0.0078 v_A - 0.00627 L = 19.7 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, M = 0.310

S

Space mean speed in ramp influence area, S = 61.3 mph

R

Space mean speed in outer lanes, S = 67.6 mph

0

Space mean speed for all vehicles, S = 63.1 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3200	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-flow speed on ramp	35.0	mph
Volume on ramp	623	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane	1500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	86	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	3500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3200	623	86	vph
Peak-hour factor, PHF	0.92	0.92	0.92	

Peak 15-min volume, v_{15}	870	169	23	v
Trucks and buses	10	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3652	711	98	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)

EQ

$P = 0.555$ Using Equation 0

FM

$v_{12} = v_{12} (P) = 2027$ pc/h

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	4363	7200	No
FO			
v_{12} or v_{12}	1625 pc/h	(Equation 13-14 or 13-17)	
3 av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
3 av34			
Is v_{12} or v_{12}	> 1.5 $v_{12} / 2$	Yes	
3 av34	12		
If yes, v_{12}	= 2086	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2797	4600	No
12A			

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = -1.3$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable, $M = 0.070$

S

Space mean speed in ramp influence area, $S = 68.0$ mph

R

Space mean speed in outer lanes, $S = 66.2$ mph

0

Space mean speed for all vehicles, $S = 67.4$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3621	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	824	vph
Length of first accel/decel lane	1120	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	202	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2900	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3621	824	202	vph
Peak-hour factor, PHF	0.92	0.90	0.91	

Peak 15-min volume, v_{15}	984	229	55	v
Trucks and buses	10	7	19	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.966	0.913	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	4133	948	243	pcph

Estimation of V12 Merge Areas

$$L = 1012.81 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.609 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 2516 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	5081	7200	No
FO			
v_{12} or v_{12}	1617 pc/h	(Equation 13-14 or 13-17)	
v_{12} or v_{12}			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
v_{12} or v_{12}			
Is v_{12} or v_{12}	> 1.5 v_{12} / 2	Yes	
v_{12} or v_{12}			
If yes, v_{12}	= 2516	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3464	4600	No
12A			

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 25.0 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

$$\text{Intermediate speed variable, } M = 0.367$$

S

$$\text{Space mean speed in ramp influence area, } S = 59.7 \text{ mph}$$

R

$$\text{Space mean speed in outer lanes, } S = 66.0 \text{ mph}$$

0

$$\text{Space mean speed for all vehicles, } S = 61.6 \text{ mph}$$

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	4030	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	198	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	802	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	750	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	4030	198	802	vph
Peak-hour factor, PHF	0.93	0.90	0.95	

Peak 15-min volume, v_{15}	1083	55	211	v
Trucks and buses	15	7	6	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.966	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	4658	228	870	pcph

Estimation of V12 Merge Areas

$$L = 1139.80 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.595 \text{ Using Equation 2}$$

FM

$$v_{12} = v_{12} (P) = 2771 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	4886	7200	No
FO			
v_{12} or v_{12}	1887 pc/h	(Equation 13-14 or 13-17)	
3 av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
3 av34			
Is v_{12} or v_{12}	> 1.5 $v_{12} / 2$	Yes	
3 av34	12		
If yes, v_{12}	= 2771	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2999	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 19.4 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

$$\text{Intermediate speed variable, } M = 0.294$$

S

$$\text{Space mean speed in ramp influence area, } S = 61.8 \text{ mph}$$

R

$$\text{Space mean speed in outer lanes, } S = 65.0 \text{ mph}$$

0

$$\text{Space mean speed for all vehicles, } S = 63.0 \text{ mph}$$

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3881	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	156	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	347	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3881	156	347	vph
Peak-hour factor, PHF	0.93	0.92	0.92	

Peak 15-min volume, v ₁₅	1043	42	94	v
Trucks and buses	15	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.930	0.952	0.952	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	4486	178	396	pcph

Estimation of V₁₂ Merge Areas

$$L = 1092.30 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.619 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 2779 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v	4664	7200	No
FO			
v or v ₃	1707 pc/h	(Equation 13-14 or 13-17)	
av ₃₄			
Is v or v ₃	> 2700 pc/h?	No	
av ₃₄			
Is v or v ₃	> 1.5 v ₁₂ / 2	Yes	
av ₃₄	12		
If yes, v _{12A}	= 2779	(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v	2957	4600	No
12A			

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_R + 0.0078 v_A - 0.00627 L = 19.1 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

$$\text{Intermediate speed variable, } M = 0.291$$

S

$$\text{Space mean speed in ramp influence area, } S_R = 61.9 \text{ mph}$$

R

$$\text{Space mean speed in outer lanes, } S_0 = 65.7 \text{ mph}$$

0

$$\text{Space mean speed for all vehicles, } S = 63.2 \text{ mph}$$

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3348	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	218	vph
Length of first accel/decel lane	900	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	672	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	3300	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3348	218	672	vph
Peak-hour factor, PHF	0.93	0.90	0.91	

Peak 15-min volume, v_{15}	900	61	185	v
Trucks and buses	15	13	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.939	0.966	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3870	258	764	pcph

Estimation of V12 Merge Areas

$$L = 711.19 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.603 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 2332 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	4128	7200	No
FO			
v_{12} or v_{12}	1538 pc/h	(Equation 13-14 or 13-17)	
3 av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
3 av34			
Is v_{12} or v_{12}	> 1.5 $v_{12} / 2$	Yes	
3 av34	12		
If yes, v_{12}	= 2332	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2590	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 19.9 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.310$

S

Space mean speed in ramp influence area, $S = 61.3 \text{ mph}$

R

Space mean speed in outer lanes, $S = 66.3 \text{ mph}$

0

Space mean speed for all vehicles, $S = 63.1 \text{ mph}$

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3368	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	69	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	198	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3368	69	198	vph
Peak-hour factor, PHF	0.93	0.90	0.90	

Peak 15-min volume, v_{15}	905	19	55	v
Trucks and buses	15	24	21	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.893	0.905	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3893	86	243	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)

EQ

$P = 1.000$ Using Equation 0

FM

$v_{12} = v_{15} (P_{FM}) = 3893$ pc/h

12 F FM

Capacity Checks

v_{12}	Actual 3979	Maximum 4800	LOS F? No
FO			
v_{12} or v_{15}	0 pc/h	(Equation 13-14 or 13-17)	
$\frac{v_{12}}{3}$ or $\frac{v_{15}}{3}$			
Is $\frac{v_{12}}{3}$ or $\frac{v_{15}}{3} > 2700$ pc/h?		No	
Is $\frac{v_{12}}{3}$ or $\frac{v_{15}}{3} > 1.5 \frac{v_{12}}{12}$		No	
If yes, $v_{12} = 3893$		(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

v_{12}	Actual 3979	Max Desirable 4600	Violation? No
R12			

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 \frac{v_{12}}{R} + 0.0078 \frac{v_{15}}{A} - 0.00627 L = 31.5$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable, $M = 0.474$

S

Space mean speed in ramp influence area, $S_R = 56.7$ mph

R

Space mean speed in outer lanes, $S_0 = N/A$ mph

0

Space mean speed for all vehicles, $S = 56.7$ mph

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Jedburg Road (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.95
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 718 veh/h
Opposing direction volume, Vo 521 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.2
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.993	0.986
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	761 pc/h	556 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	2.0	mi/h
Average travel speed, ATSD	31.3	mi/h
Percent Free Flow Speed, PFFS	71.9	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	756 pc/h	548 pc/h
Base percent time-spent-following,(note-4) BPTSFd	65.1	%
Adjustment for no-passing zones, fnp	29.9	
Percent time-spent-following, PTSFd	82.4	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.45
Peak 15-min vehicle-miles of travel, VMT15	189 veh-mi
Peak-hour vehicle-miles of travel, VMT60	718 veh-mi
Peak 15-min total travel time, TT15	6.0 veh-h
Capacity from ATS, CdATS	1676 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1676 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	31.3	mi/h
Percent time-spent-following, PTSFd (from above)	82.4	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 755.8
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 6.08
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Jedburg Road (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	60 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 877 veh/h
Opposing direction volume, Vo 1069 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	1.000	1.000
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	953 pc/h	1162 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	0.6	mi/h
Average travel speed, ATSD	26.5	mi/h
Percent Free Flow Speed, PFFS	60.9	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	953 pc/h	1162 pc/h
Base percent time-spent-following,(note-4) BPTSFd	78.4	%
Adjustment for no-passing zones, fnp	15.3	
Percent time-spent-following, PTSFd	85.3	%

Level of Service and Other Performance Measures

Level of service, LOS	E
Volume to capacity ratio, v/c	0.56
Peak 15-min vehicle-miles of travel, VMT15	238 veh-mi
Peak-hour vehicle-miles of travel, VMT60	877 veh-mi
Peak 15-min total travel time, TT15	9.0 veh-h
Capacity from ATS, CdATS	1700 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1700 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	26.5	mi/h
Percent time-spent-following, PTSFd (from above)	85.3	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 953.3
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 6.20
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Volvo Car Drive (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	6.0 ft	% Trucks and buses	10 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	20 %
Up/down	- %	Access point density	8 /mi

Analysis direction volume, Vd 433 veh/h
Opposing direction volume, Vo 779 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.2	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.980	0.990
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	480 pc/h	855 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 0.0 mi/h
Adj. for access point density,(note-3) fA 2.0 mi/h

Free-flow speed, FFSd	48.0	mi/h
Adjustment for no-passing zones, fnp	0.4	mi/h
Average travel speed, ATSD	37.3	mi/h
Percent Free Flow Speed, PFFS	77.7	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	471 pc/h	847 pc/h
Base percent time-spent-following,(note-4) BPTSFd	53.7	%
Adjustment for no-passing zones, fnp	18.3	
Percent time-spent-following, PTSFd	60.2	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.28
Peak 15-min vehicle-miles of travel, VMT15	118 veh-mi
Peak-hour vehicle-miles of travel, VMT60	433 veh-mi
Peak 15-min total travel time, TT15	3.2 veh-h
Capacity from ATS, CdATS	1683 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1683 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	37.3	mi/h
Percent time-spent-following, PTSFd (from above)	60.2	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 470.7
Effective width of outside lane, We 24.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.06
Bicycle LOS E

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 27 (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	7 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	30 /mi

Analysis direction volume, Vd 597 veh/h
Opposing direction volume, Vo 769 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.993	1.000
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	668 pc/h	854 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 7.5 mi/h

Free-flow speed, FFSd	43.3	mi/h
Adjustment for no-passing zones, fnp	1.2	mi/h
Average travel speed, ATSD	30.3	mi/h
Percent Free Flow Speed, PFFS	70.0	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	663 pc/h	854 pc/h
Base percent time-spent-following,(note-4) BPTSFd	64.1	%
Adjustment for no-passing zones, fnp	25.8	
Percent time-spent-following, PTSFd	75.4	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.39
Peak 15-min vehicle-miles of travel, VMT15	166 veh-mi
Peak-hour vehicle-miles of travel, VMT60	597 veh-mi
Peak 15-min total travel time, TT15	5.5 veh-h
Capacity from ATS, CdATS	1700 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1700 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	30.3	mi/h
Percent time-spent-following, PTSFd (from above)	75.4	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 663.3
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 6.15
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 27 (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	10 /mi

Analysis direction volume, Vd 547 veh/h
Opposing direction volume, Vo 667 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.993	0.993
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	612 pc/h	746 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 2.5 mi/h

Free-flow speed, FFSd	49.5	mi/h
Adjustment for no-passing zones, fnp	1.5	mi/h
Average travel speed, ATSD	37.5	mi/h
Percent Free Flow Speed, PFFS	75.8	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	608 pc/h	741 pc/h
Base percent time-spent-following,(note-4) BPTSFd	60.0	%
Adjustment for no-passing zones, fnp	29.3	
Percent time-spent-following, PTSFd	73.2	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.36
Peak 15-min vehicle-miles of travel, VMT15	152 veh-mi
Peak-hour vehicle-miles of travel, VMT60	547 veh-mi
Peak 15-min total travel time, TT15	4.1 veh-h
Capacity from ATS, CdATS	1688 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1688 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	37.5	mi/h
Percent time-spent-following, PTSFd (from above)	73.2	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 607.8
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.97
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 453 (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	24 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	75 %
Up/down	- %	Access point density	4 /mi

Analysis direction volume, Vd 186 veh/h
Opposing direction volume, Vo 214 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.5	1.5
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.893	0.893
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	231 pc/h	266 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.7 mi/h
Adj. for access point density,(note-3) fA 1.0 mi/h

Free-flow speed, FFSd	39.3	mi/h
Adjustment for no-passing zones, fnp	3.2	mi/h
Average travel speed, ATSD	32.2	mi/h
Percent Free Flow Speed, PFFS	82.0	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.977	0.977
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	212 pc/h	243 pc/h
Base percent time-spent-following,(note-4) BPTSFd	24.2	%
Adjustment for no-passing zones, fnp	58.5	
Percent time-spent-following, PTSFd	51.5	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.14
Peak 15-min vehicle-miles of travel, VMT15	52 veh-mi
Peak-hour vehicle-miles of travel, VMT60	186 veh-mi
Peak 15-min total travel time, TT15	1.6 veh-h
Capacity from ATS, CdATS	1518 veh/h
Capacity from PTSF, CdPTSF	1660 veh/h
Directional Capacity	1518 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.2	mi/h
Percent time-spent-following, PTSFd (from above)	51.5	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 206.7
Effective width of outside lane, We 12.50
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 14.44
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 453 (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	24 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	70 %
Up/down	- %	Access point density	16 /mi

Analysis direction volume, Vd 202 veh/h
Opposing direction volume, Vo 288 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.5	1.4
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.893	0.912
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	251 pc/h	351 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 4.0 mi/h

Free-flow speed, FFSd	36.8	mi/h
Adjustment for no-passing zones, fnp	2.5	mi/h
Average travel speed, ATSD	29.6	mi/h
Percent Free Flow Speed, PFFS	80.4	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.977	0.977
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	230 pc/h	328 pc/h
Base percent time-spent-following,(note-4) BPTSFd	27.2	%
Adjustment for no-passing zones, fnp	52.9	
Percent time-spent-following, PTSFd	49.0	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.15
Peak 15-min vehicle-miles of travel, VMT15	56 veh-mi
Peak-hour vehicle-miles of travel, VMT60	202 veh-mi
Peak 15-min total travel time, TT15	1.9 veh-h
Capacity from ATS, CdATS	1550 veh/h
Capacity from PTSF, CdPTSF	1660 veh/h
Directional Capacity	1550 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	29.6	mi/h
Percent time-spent-following, PTSFd (from above)	49.0	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 224.4
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 14.42
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Jedburg Road (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.95
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 521 veh/h
Opposing direction volume, Vo 718 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.2	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.986	0.993
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	556 pc/h	761 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	1.3	mi/h
Average travel speed, ATSD	32.0	mi/h
Percent Free Flow Speed, PFFS	73.5	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	548 pc/h	756 pc/h
Base percent time-spent-following,(note-4) BPTSFd	57.0	%
Adjustment for no-passing zones, fnp	29.9	
Percent time-spent-following, PTSFd	69.6	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.33
Peak 15-min vehicle-miles of travel, VMT15	137 veh-mi
Peak-hour vehicle-miles of travel, VMT60	521 veh-mi
Peak 15-min total travel time, TT15	4.3 veh-h
Capacity from ATS, CdATS	1688 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1688 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.0	mi/h
Percent time-spent-following, PTSFd (from above)	69.6	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 548.4
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.92
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Jedburg Road (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	60 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 1069 veh/h
Opposing direction volume, Vo 877 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	1.000	1.000
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	1162 pc/h	953 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	0.6	mi/h
Average travel speed, ATSD	26.4	mi/h
Percent Free Flow Speed, PFFS	60.8	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	1162 pc/h	953 pc/h
Base percent time-spent-following,(note-4) BPTSFd	81.4	%
Adjustment for no-passing zones, fnp	15.3	
Percent time-spent-following, PTSFd	89.8	%

Level of Service and Other Performance Measures

Level of service, LOS	E
Volume to capacity ratio, v/c	0.68
Peak 15-min vehicle-miles of travel, VMT15	290 veh-mi
Peak-hour vehicle-miles of travel, VMT60	1069 veh-mi
Peak 15-min total travel time, TT15	11.0 veh-h
Capacity from ATS, CdATS	1700 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1700 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	26.4	mi/h
Percent time-spent-following, PTSFd (from above)	89.8	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 1162.0
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 6.30
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Volvo Car Drive (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	6.0 ft	% Trucks and buses	10 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	20 %
Up/down	- %	Access point density	8 /mi

Analysis direction volume, Vd 779 veh/h
Opposing direction volume, Vo 433 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.2
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.990	0.980
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	855 pc/h	480 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 0.0 mi/h
Adj. for access point density,(note-3) fA 2.0 mi/h

Free-flow speed, FFSd	48.0	mi/h
Adjustment for no-passing zones, fnp	0.8	mi/h
Average travel speed, ATSD	36.8	mi/h
Percent Free Flow Speed, PFFS	76.7	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	847 pc/h	471 pc/h
Base percent time-spent-following,(note-4) BPTSFd	68.4	%
Adjustment for no-passing zones, fnp	18.3	
Percent time-spent-following, PTSFd	80.2	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.50
Peak 15-min vehicle-miles of travel, VMT15	212 veh-mi
Peak-hour vehicle-miles of travel, VMT60	779 veh-mi
Peak 15-min total travel time, TT15	5.8 veh-h
Capacity from ATS, CdATS	1666 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1666 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	36.8	mi/h
Percent time-spent-following, PTSFd (from above)	80.2	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 846.7
Effective width of outside lane, We 24.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.36
Bicycle LOS E

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 27 (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	7 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	30 /mi

Analysis direction volume, Vd 769 veh/h
Opposing direction volume, Vo 597 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	1.000	0.993
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	854 pc/h	668 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 7.5 mi/h

Free-flow speed, FFSd	43.3	mi/h
Adjustment for no-passing zones, fnp	1.6	mi/h
Average travel speed, ATSD	29.9	mi/h
Percent Free Flow Speed, PFFS	69.0	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	854 pc/h	663 pc/h
Base percent time-spent-following,(note-4) BPTSFd	70.2	%
Adjustment for no-passing zones, fnp	25.8	
Percent time-spent-following, PTSFd	84.7	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.50
Peak 15-min vehicle-miles of travel, VMT15	214 veh-mi
Peak-hour vehicle-miles of travel, VMT60	769 veh-mi
Peak 15-min total travel time, TT15	7.2 veh-h
Capacity from ATS, CdATS	1688 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1688 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	29.9	mi/h
Percent time-spent-following, PTSFd (from above)	84.7	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 854.4
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 6.27
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 27 (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	10 /mi

Analysis direction volume, Vd 667 veh/h
Opposing direction volume, Vo 547 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.993	0.993
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	746 pc/h	612 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 2.5 mi/h

Free-flow speed, FFSd	49.5	mi/h
Adjustment for no-passing zones, fnp	1.9	mi/h
Average travel speed, ATSD	37.1	mi/h
Percent Free Flow Speed, PFFS	75.0	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	741 pc/h	608 pc/h
Base percent time-spent-following,(note-4) BPTSFd	64.3	%
Adjustment for no-passing zones, fnp	29.3	
Percent time-spent-following, PTSFd	80.4	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.44
Peak 15-min vehicle-miles of travel, VMT15	185 veh-mi
Peak-hour vehicle-miles of travel, VMT60	667 veh-mi
Peak 15-min total travel time, TT15	5.0 veh-h
Capacity from ATS, CdATS	1688 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1688 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	37.1	mi/h
Percent time-spent-following, PTSFd (from above)	80.4	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 741.1
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 6.07
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 453 (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	24 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	75 %
Up/down	- %	Access point density	4 /mi

Analysis direction volume, Vd 214 veh/h
Opposing direction volume, Vo 186 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.5	1.5
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.893	0.893
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	266 pc/h	231 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.7 mi/h
Adj. for access point density,(note-3) fA 1.0 mi/h

Free-flow speed, FFSd	39.3	mi/h
Adjustment for no-passing zones, fnp	3.4	mi/h
Average travel speed, ATSD	32.0	mi/h
Percent Free Flow Speed, PFFS	81.5	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.977	0.977
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	243 pc/h	212 pc/h
Base percent time-spent-following,(note-4) BPTSFd	25.1	%
Adjustment for no-passing zones, fnp	58.5	
Percent time-spent-following, PTSFd	56.3	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.16
Peak 15-min vehicle-miles of travel, VMT15	59 veh-mi
Peak-hour vehicle-miles of travel, VMT60	214 veh-mi
Peak 15-min total travel time, TT15	1.8 veh-h
Capacity from ATS, CdATS	1518 veh/h
Capacity from PTSF, CdPTSF	1660 veh/h
Directional Capacity	1518 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.0	mi/h
Percent time-spent-following, PTSFd (from above)	56.3	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 237.8
Effective width of outside lane, We 12.50
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 14.51
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
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Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 453 (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	24 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	70 %
Up/down	- %	Access point density	16 /mi

Analysis direction volume, Vd 288 veh/h
Opposing direction volume, Vo 202 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.4	1.5
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.912	0.893
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	351 pc/h	251 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 4.0 mi/h

Free-flow speed, FFSd 36.8 mi/h

Adjustment for no-passing zones, fnp 3.1 mi/h

Average travel speed, ATSD 29.0 mi/h

Percent Free Flow Speed, PFFS 78.8 %

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.977	0.977
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	328 pc/h	230 pc/h
Base percent time-spent-following,(note-4) BPTSFd	33.1 %	
Adjustment for no-passing zones, fnp	52.9	
Percent time-spent-following, PTSFd	64.2 %	

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.21
Peak 15-min vehicle-miles of travel, VMT15	80 veh-mi
Peak-hour vehicle-miles of travel, VMT60	288 veh-mi
Peak 15-min total travel time, TT15	2.8 veh-h
Capacity from ATS, CdATS	1518 veh/h
Capacity from PTSF, CdPTSF	1660 veh/h
Directional Capacity	1518 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0 mi
Length of two-lane highway upstream of the passing lane, Lu	- mi
Length of passing lane including tapers, Lpl	- mi
Average travel speed, ATSD (from above)	29.0 mi/h
Percent time-spent-following, PTSFd (from above)	64.2
Level of service, LOSd (from above)	C

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	- mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	- mi
Adj. factor for the effect of passing lane on average speed, fpl	-
Average travel speed including passing lane, ATSpl	-
Percent free flow speed including passing lane, PFFSpl	0.0 %

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 320.0
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 14.60
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

June 2019

C.6 2023 BUILD – ALTERNATIVE 2



HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1525	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	55	vph
Length of first accel/decel lane	465	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	142	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1525	55	142	vph
Peak-hour factor, PHF	0.91	0.95	0.90	

Peak 15-min volume, v ₁₅	419	14	39	v
Trucks and buses	24	53	36	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.893	0.791	0.847	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	1877	73	186	pcph

Estimation of V₁₂ Diverge Areas

L = (Equation 13-12 or 13-13)

EQ

P = 1.000 Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 1877$ pc/h

12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	1877	4800	No
$v_{12} = v_F - v_R$	1804	4800	No
$v_{12} = v_F$	73	2000	No
v_{12} or v_{12}	0 pc/h	(Equation 13-14 or 13-17)	
3 av ₃₄			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
3 av ₃₄			
Is v_{12} or v_{12}	> 1.5 v ₁₂ / 2	No	
3 av ₃₄	12		
If yes, v _{12A} = 1877	(Equation 13-15, 13-16, 13-18, or 13-19)		
12A			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1877	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 16.2$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.435$

S

Space mean speed in ramp influence area, $S = 57.8$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 57.8 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: Between SC 27 Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1529	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	36	vph
Length of first accel/decel lane	650	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	507	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1450	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1529	36	507	vph
Peak-hour factor, PHF	0.91	0.90	0.90	

Peak 15-min volume, v_{15}	420	10	141	v
Trucks and buses	24	23	16	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.897	0.926	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	1882	45	608	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.711$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 1351$ pc/h

$v_{12} = 1351$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	1882	7200	No
$v_{12} = v_F + (v_R - v_F) P$	1837	7200	No
$v_{12} = v_F + (v_R - v_F) P$	45	2000	No
$v_{12} = v_F + (v_R - v_F) P$	531 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} > 2700$ pc/h?		No	
Is $v_{12} > 1.5 v_F / 2$		No	
If yes, $v_{12} = 1351$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1351	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 10.0+$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.432$

S

Space mean speed in ramp influence area, $S = 57.9$ mph

R

Space mean speed in outer lanes, S = 76.8 mph

0

Space mean speed for all vehicles, S = 62.2 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1612	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	83	vph
Length of first accel/decel lane	250	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	36	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	1600	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1612	83	36	vph
Peak-hour factor, PHF	0.91	0.90	0.90	

Peak 15-min volume, v_{15}	443	23	10	v
Trucks and buses	24	23	23	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.897	0.897	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	1984	103	45	pcph

Estimation of V12 Diverge Areas

$$L = 42.93 \text{ (Equation 13-12 or 13-13)}$$

EQ

$$P = 0.706 \text{ Using Equation 5}$$

FD

$$v_{12} = v_F + (v_R - v_F) P = 1430 \text{ pc/h}$$

12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	1984	7200	No
$v_{12} = v_F - v_R$	1881	7200	No
$v_{12} = v_R$	103	2000	No
$v_{12} \text{ or } v_{12}$	554 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_{12} > 2700 \text{ pc/h?}$		No	
Is $v_{12} \text{ or } v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 1430$	(Equation 13-15, 13-16, 13-18, or 13-19)		
12A			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1430	4400	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L = 14.3 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

$$\text{Intermediate speed variable, } D = 0.437$$

S

$$\text{Space mean speed in ramp influence area, } S = 57.8 \text{ mph}$$

R

Space mean speed in outer lanes, S = 76.8 mph

0

Space mean speed for all vehicles, S = 62.1 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2000	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	98	vph
Length of first accel/decel lane	1200	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	89	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	3500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2000	98	89	vph
Peak-hour factor, PHF	0.91	0.92	0.92	

Peak 15-min volume, v_{15}	549	27	24	v
Trucks and buses	24	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2462	112	102	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.693$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 1741$ pc/h

$v_{12} = 1741$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	2462	7200	No
$v_{12} = v_F - v_R$	2350	7200	No
$v_{12} = v_R$	112	2000	No
v_{12} or v_{12}	721 pc/h	(Equation 13-14 or 13-17)	
Is v_{12} or $v_{12} > 2700$ pc/h?		No	
Is v_{12} or $v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 1741$	(Equation 13-15, 13-16, 13-18, or 13-19)		
$v_{12} = 1741$			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1741	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 8.4$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable, $D = 0.438$

S

Space mean speed in ramp influence area, $S = 57.7$ mph

R

Space mean speed in outer lanes, S = 76.8 mph

0

Space mean speed for all vehicles, S = 62.3 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1991	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	145	vph
Length of first accel/decel lane	180	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	864	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2900	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1991	145	864	vph
Peak-hour factor, PHF	0.91	0.90	0.90	

Peak 15-min volume, v_{15}	547	40	240	v
Trucks and buses	24	29	11	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.873	0.948	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2450	184	1013	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.690$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 1748$ pc/h

$v_{12} = 1748$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	2450	7200	No
$v_{12} = v_F + (v_R - v_F) P$	2266	7200	No
$v_{12} = v_R$	184	2000	No
$v_{12} = v_F$ or $v_{12} = v_R$	702 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} > 2700$ pc/h?		No	
Is $v_{12} > 1.5 v_F / 2$		No	
If yes, $v_{12} = 1748$	(Equation 13-15, 13-16, 13-18, or 13-19)		

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1748	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 17.7$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.445$

S

Space mean speed in ramp influence area, $S = 57.6$ mph

R

Space mean speed in outer lanes, S = 76.8 mph

0

Space mean speed for all vehicles, S = 62.0 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2750	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	316	vph
Length of first accel/decel lane	850	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	151	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	750	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2750	316	151	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v_{15}	747	88	42	v
Trucks and buses	22	10	11	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.952	0.948	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3318	369	177	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.660$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 2316$ pc/h

$v_{12} = 2316$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	3318	7200	No
$v_{12} = v_F - v_R$	2949	7200	No
$v_{12} = v_F$	369	2000	No
v_{12} or v_{12}	1002 pc/h	(Equation 13-14 or 13-17)	
Is v_{12} or $v_{12} > 2700$ pc/h?	No		
Is v_{12} or $v_{12} > 1.5 v_{12} / 2$	No		
If yes, $v_{12} = 2316$	(Equation 13-15, 13-16, 13-18, or 13-19)		

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2316	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 16.5$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.461$

S

Space mean speed in ramp influence area, $S = 57.1$ mph

R

Space mean speed in outer lanes, S = 76.8 mph

0

Space mean speed for all vehicles, S = 61.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2902	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	152	vph
Length of first accel/decel lane	150	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	316	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	920	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2902	152	316	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v_{15}	789	42	88	v
Trucks and buses	22	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3501	177	369	pcph

Estimation of V12 Diverge Areas

$$L = 379.52 \text{ (Equation 13-12 or 13-13)}$$

EQ

$$P = 0.664 \text{ Using Equation 5}$$

FD

$$v_{12} = v_F + (v_R - v_F) P = 2385 \text{ pc/h}$$

12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	3501	7200	No
$v_{12} = v_F - v_R$	3324	7200	No
$v_{12} = v_F$	177	2000	No
$v_{12} \text{ or } v_{12}$	1116 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_{12} > 2700 \text{ pc/h?}$		No	
Is $v_{12} \text{ or } v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 2385$	(Equation 13-15, 13-16, 13-18, or 13-19)		
12A			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2385	4400	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L = 23.4 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

$$\text{Intermediate speed variable, } D = 0.444$$

S

$$\text{Space mean speed in ramp influence area, } S = 57.6 \text{ mph}$$

R

Space mean speed in outer lanes, S = 76.3 mph

0

Space mean speed for all vehicles, S = 62.5 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2585	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	394	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane	1500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	23	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2585	394	23	vph
Peak-hour factor, PHF	0.92	0.92	0.92	

Peak 15-min volume, v_{15}	702	107	6	v
Trucks and buses	22	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3119	450	26	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.450$ Using Equation 0

FD

$v_{12R} = v_F + (v - v_F) P = 1651$ pc/h

v_{12R} FD

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12R} = v_F$	3119	7200	No
$v_{12R} = v_F - v_R$	2669	7200	No
v_{12R}	450	4000	No
v_{12R} or v_{12R}	1468 pc/h	(Equation 13-14 or 13-17)	
Is v_{12R} or $v_{12R} > 2700$ pc/h?		No	
Is v_{12R} or $v_{12R} > 1.5 v_{12R} / 2$		Yes	
If yes, $v_{12A} = 1782$	(Equation 13-15, 13-16, 13-18, or 13-19)		

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	1782	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12R} - 0.009 L = -20.9$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable, $D = 0.469$

S

Space mean speed in ramp influence area, $S = 56.9$ mph

R

Space mean speed in outer lanes, S = 75.5 mph

0

Space mean speed for all vehicles, S = 63.6 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2012	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	174	vph
Length of first accel/decel lane	250	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	117	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1300	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2012	174	117	vph
Peak-hour factor, PHF	0.92	0.94	0.90	

Peak 15-min volume, v_{15}	547	46	33	v
Trucks and buses	22	25	16	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.889	0.926	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2428	208	140	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.690$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 1739$ pc/h

$v_{12} = 1739$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	2428	7200	No
$v_{12} = v_F + (v_R - v_F) P$	2220	7200	No
$v_{12} = v_R$	208	2000	No
$v_{12} = v_F$ or $v_{12} = v_R$	689 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} > 2700$ pc/h?		No	
Is $v_{12} > 1.5 v_F / 2$		No	
If yes, $v_{12} = 1739$	(Equation 13-15, 13-16, 13-18, or 13-19)		

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1739	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 17.0$ pc/mi/ln

$D = 17.0$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.447$

S

Space mean speed in ramp influence area, $S = 57.5$ mph

R

Space mean speed in outer lanes, S = 76.8 mph

0

Space mean speed for all vehicles, S = 61.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2214	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	202	vph
Length of first accel/decel lane	250	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	174	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	1775	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2214	202	174	vph
Peak-hour factor, PHF	0.92	0.94	0.94	

Peak 15-min volume, v_{15}	602	54	46	v
Trucks and buses	22	25	25	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.889	0.889	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2671	242	208	pcph

Estimation of V12 Diverge Areas

$$L = 213.35 \text{ (Equation 13-12 or 13-13)}$$

EQ

$$P = 0.682 \text{ Using Equation 5}$$

FD

$$v_{12} = v_F + (v_R - v_F) P = 1899 \text{ pc/h}$$

12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	2671	7200	No
$v_{12} = v_F - v_R$	2429	7200	No
$v_{12} = v_F$	242	2000	No
$v_{12} \text{ or } v_{12}$	772 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_{12} > 2700 \text{ pc/h?}$		No	
Is $v_{12} \text{ or } v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 1899$	(Equation 13-15, 13-16, 13-18, or 13-19)		
12A			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1899	4400	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L = 18.3 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

$$\text{Intermediate speed variable, } D = 0.450$$

S

$$\text{Space mean speed in ramp influence area, } S = 57.4 \text{ mph}$$

R

Space mean speed in outer lanes, S = 76.8 mph

0

Space mean speed for all vehicles, S = 61.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1955	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	161	vph
Length of first accel/decel lane	475	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	54	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1955	161	54	vph
Peak-hour factor, PHF	0.92	0.90	0.92	

Peak 15-min volume, v_{15}	531	45	15	v
Trucks and buses	22	46	36	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.813	0.847	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2359	220	69	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 2359$ pc/h

$v_{12} = 2359$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	2359	4800	No
$v_{12} = v_F - v_R$	2139	4800	No
$v_{12} = v_R$	220	2000	No
$v_{12} \text{ or } v_{12}$	0 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_{12} > 2700$ pc/h?		No	
Is $v_{12} \text{ or } v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 2359$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2359	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 20.3$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.448$

S

Space mean speed in ramp influence area, $S = 57.5$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 57.5 mph

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: West of SC 453
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1525	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	419	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	938	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.2	mi/h
Free-flow speed, FFS	72.2	mi/h

LOS and Performance Measures

Flow rate, vp	938	pc/h/ln
Free-flow speed, FFS	72.2	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	2	
Density, D	13.4	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Between SC 453 Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1470	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	404	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	905	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.33	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.3	mi/h
Free-flow speed, FFS	74.1	mi/h

LOS and Performance Measures

Flow rate, vp	905	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	2	
Density, D	12.1	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: SC 453 to SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1612	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	443	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	992	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	992	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	2	
Density, D	13.2	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Between SC 27 Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1493	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	410	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	613	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	613	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	8.2	pc/mi/ln
Level of service, LOS	A	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Between SC 27 Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1529	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	420	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	627	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	627	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	8.4	pc/mi/ln
Level of service, LOS	A	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Between SC 27 & Volvo
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2000	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	549	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	821	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	821	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	10.9	pc/mi/ln
Level of service, LOS	A	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Between Volvo Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1902	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	523	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	780	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	780	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	10.4	pc/mi/ln
Level of service, LOS	A	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Volvo to Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1991	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	547	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	817	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	817	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	10.9	pc/mi/ln
Level of service, LOS	A	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1846	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	507	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	757	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.50	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.8	mi/h
Free-flow speed, FFS	73.6	mi/h

LOS and Performance Measures

Flow rate, vp	757	pc/h/ln
Free-flow speed, FFS	73.6	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	10.1	pc/mi/ln
Level of service, LOS	A	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Jedburg to Nexton
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2710	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	745	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	1112	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.20	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.8	mi/h
Free-flow speed, FFS	71.6	mi/h

LOS and Performance Measures

Flow rate, vp	1112	pc/h/ln
Free-flow speed, FFS	71.6	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	3	
Density, D	15.9	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Nexton to Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2902	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	789	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1167	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.33	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	4.1	mi/h
Free-flow speed, FFS	71.3	mi/h

LOS and Performance Measures

Flow rate, vp	1167	pc/h/ln
Free-flow speed, FFS	71.3	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	3	
Density, D	16.7	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2434	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	661	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	979	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	979	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	13.1	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2750	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	747	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1106	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1106	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	74.9	mi/h
Number of lanes, N	3	
Density, D	14.8	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Jeddburg to Volvo
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2585	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	702	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1040	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	1040	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	13.9	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between Volvo Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2191	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	595	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	881	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, v_p	881	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	11.7	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between Volvo & SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2214	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	602	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	890	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	890	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	11.9	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between SC 27 Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1838	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	499	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	739	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	739	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	9.9	pc/mi/ln
Level of service, LOS	A	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between SC 27 Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2012	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	547	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	809	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	809	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	10.8	pc/mi/ln
Level of service, LOS	A	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: SC 27 to SC 453
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1955	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	531	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1179	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	1179	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	74.6	mi/h
Number of lanes, N	2	
Density, D	15.8	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between SC 453 Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1794	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	487	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1082	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.33	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.3	mi/h
Free-flow speed, FFS	74.1	mi/h

LOS and Performance Measures

Flow rate, vp	1082	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	74.9	mi/h
Number of lanes, N	2	
Density, D	14.4	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: West of SC 453
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1898	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	516	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1145	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.2	mi/h
Free-flow speed, FFS	72.2	mi/h

LOS and Performance Measures

Flow rate, vp	1145	pc/h/ln
Free-flow speed, FFS	72.2	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	2	
Density, D	16.4	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1470	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	142	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	55	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1470	142	55	vph
Peak-hour factor, PHF	0.91	0.90	0.95	

Peak 15-min volume, v ₁₅	404	39	14	v
Trucks and buses	24	36	53	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.893	0.847	0.791	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	1809	186	73	pcph

Estimation of V₁₂ Merge Areas

L = (Equation 13-6 or 13-7)

EQ

P = 1.000 Using Equation 0

FM

v = v₁₂ (P) = 1809 pc/h

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v ₁₂	1995	4800	No
FO			
v ₃ or v _{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v ₃ or v _{av34} > 2700 pc/h?		No	
Is v ₃ or v _{av34} > 1.5 v ₁₂ / 2		No	
If yes, v _{12A} = 1809		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v ₁₂	1995	4600	No

Level of Service Determination (if not F)

Density, D = $5.475 + 0.00734 v_{12} + 0.0078 v_A - 0.00627 L$ = 15.9 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, M = 0.294

S

Space mean speed in ramp influence area, S = 61.8 mph

R

Space mean speed in outer lanes, S = N/A mph

0

Space mean speed for all vehicles, S = 61.8 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1493	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	507	vph
Length of first accel/decel lane	900	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	36	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1450	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1493	507	36	vph
Peak-hour factor, PHF	0.91	0.90	0.90	

Peak 15-min volume, v_{15}	410	141	10	v
Trucks and buses	24	16	23	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.926	0.897	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	1838	608	45	pcph

Estimation of V12 Merge Areas

$$L = 351.24 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.603 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 1108 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	2446	7200	No
FO			
v_{12} or v_{12}	730 pc/h	(Equation 13-14 or 13-17)	
$\frac{v_{12}}{3}$ av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
$\frac{v_{12}}{3}$ av34			
Is v_{12} or v_{12}	> 1.5 $v_{12} / 2$	Yes	
$\frac{v_{12}}{3}$ av34	12		
If yes, v_{12}	= 1108	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1716	4600	No
12A			

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 12.9 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.280$

S

Space mean speed in ramp influence area, $S = 62.2$ mph

R

Space mean speed in outer lanes, $S = 69.2$ mph

0

Space mean speed for all vehicles, $S = 64.1$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1902	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-flow speed on ramp	35.0	mph
Volume on ramp	89	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane	1500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	98	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	3500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
	Ramp			
Volume, V (vph)	1902	89	98	vph
Peak-hour factor, PHF	0.91	0.92	0.92	

Peak 15-min volume, v ₁₅	523	24	27	v
Trucks and buses	24	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.893	0.952	0.952	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	2341	102	112	pcph

Estimation of V12 Merge Areas

L = (Equation 13-6 or 13-7)

EQ

P = 0.555 Using Equation 0

FM

v = v_P = 1299 pc/h

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v	2443	7200	No
FO			
v or v ₃	1042 pc/h	(Equation 13-14 or 13-17)	
av ₃₄			
Is v or v ₃	> 2700 pc/h?	No	
av ₃₄			
Is v or v ₃	> 1.5 v ₁₂ / 2	Yes	
av ₃₄	12		
If yes, v _{12A}	= 1337	(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v _{12A}	1439	4600	No

Level of Service Determination (if not F)

Density, D = $5.475 + 0.00734 v_R + 0.0078 v_A - 0.00627 L$ = -11.6 pc/mi/ln

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable, M = 0.022

S

Space mean speed in ramp influence area, S = 69.4 mph

R

Space mean speed in outer lanes, S = 68.2 mph

0

Space mean speed for all vehicles, S = 68.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1846	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	864	vph
Length of first accel/decel lane	1120	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	145	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2900	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
	Ramp			
Volume, V (vph)	1846	864	145	vph
Peak-hour factor, PHF	0.91	0.90	0.90	

Peak 15-min volume, v_{15}	507	240	40	v
Trucks and buses	24	11	29	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.948	0.873	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2272	1013	184	pcph

Estimation of V12 Merge Areas

$$L = 628.47 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.609 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 1383 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	3285	7200	No
FO			
v_{12} or v_{12}	889 pc/h	(Equation 13-14 or 13-17)	
$\frac{v_{12}}{3}$ av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
$\frac{v_{12}}{3}$ av34			
Is v_{12} or v_{12}	> 1.5 $v_{12} / 2$	Yes	
$\frac{v_{12}}{3}$ av34	12		
If yes, v_{12}	= 1383	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2396	4600	No
12A			

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 16.7 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.285$

S

Space mean speed in ramp influence area, $S = 62.0$ mph

R

Space mean speed in outer lanes, $S = 68.6$ mph

0

Space mean speed for all vehicles, $S = 63.7$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2434	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	151	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	316	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	750	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2434	151	316	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v ₁₅	661	42	88	v
Trucks and buses	22	11	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.901	0.948	0.952	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	2937	177	369	pcph

Estimation of V₁₂ Merge Areas

$$L = 760.60 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.619 \text{ Using Equation 2}$$

FM

$$v_{12} = v_{12} (P) = 1817 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v	3114	7200	No
FO			
v or v ₃	1120 pc/h	(Equation 13-14 or 13-17)	
av ₃₄			
Is v or v ₃ > 2700 pc/h?		No	
av ₃₄			
Is v or v ₃ > 1.5 v ₁₂ / 2		Yes	
av ₃₄	12		
If yes, v _{12A} = 1817		(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v	1994	4600	No
12A			

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_R + 0.0078 v_A - 0.00627 L = 11.5 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

$$\text{Intermediate speed variable, } M = 0.245$$

S

$$\text{Space mean speed in ramp influence area, } S_R = 63.1 \text{ mph}$$

R

$$\text{Space mean speed in outer lanes, } S_0 = 67.8 \text{ mph}$$

0

$$\text{Space mean speed for all vehicles, } S = 64.7 \text{ mph}$$

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2191	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	23	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	394	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent
		Ramp	
Volume, V (vph)	2191	23	394 vph
Peak-hour factor, PHF	0.92	0.92	0.92

Peak 15-min volume, v_{15}	595	6	107	v
Trucks and buses	22	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2643	26	450	pcph

Estimation of V12 Merge Areas

$$L = 665.37 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.619 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 1637 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	2669	7200	No
FO			
v_{12} or v_{12}	1006 pc/h	(Equation 13-14 or 13-17)	
$\frac{v_{12}}{3}$ av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
$\frac{v_{12}}{3}$ av34			
Is v_{12} or v_{12}	> 1.5 $v_{12} / 2$	Yes	
$\frac{v_{12}}{3}$ av34	12		
If yes, v_{12}	= 1637	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1663	4600	No
12A			

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 9.0 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

$$\text{Intermediate speed variable, } M = 0.237$$

S

$$\text{Space mean speed in ramp influence area, } S = 63.4 \text{ mph}$$

R

$$\text{Space mean speed in outer lanes, } S = 68.2 \text{ mph}$$

0

$$\text{Space mean speed for all vehicles, } S = 65.1 \text{ mph}$$

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1838	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	117	vph
Length of first accel/decel lane	900	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	174	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1300	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1838	117	174	vph
Peak-hour factor, PHF	0.92	0.90	0.94	

Peak 15-min volume, v ₁₅	499	33	46	v
Trucks and buses	22	16	25	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.901	0.926	0.889	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	2218	140	208	pcph

Estimation of V₁₂ Merge Areas

$$L = 332.41 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.603 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 1337 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v	2358	7200	No
FO			
v or v ₃	881 pc/h	(Equation 13-14 or 13-17)	
av ₃₄			
Is v or v ₃	> 2700 pc/h?	No	
av ₃₄			
Is v or v ₃	> 1.5 v ₁₂ / 2	Yes	
av ₃₄	12		
If yes, v _{12A}	= 1337	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v	1477	4600	No
12A			

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_R + 0.0078 v_A - 0.00627 L = 11.3 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, M = 0.275

S

Space mean speed in ramp influence area, S = 62.3 mph

R

Space mean speed in outer lanes, S = 68.6 mph

0

Space mean speed for all vehicles, S = 64.5 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1794	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	54	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	161	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1794	54	161	vph
Peak-hour factor, PHF	0.92	0.92	0.90	

Peak 15-min volume, v ₁₅	487	15	45	v
Trucks and buses	22	36	46	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.901	0.847	0.813	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	2164	69	220	pcph

Estimation of V12 Merge Areas

L = (Equation 13-6 or 13-7)

EQ

P = 1.000 Using Equation 0

FM

v = v₁₂ (P_{FM}) = 2164 pc/h

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v _{FO}	2233	4800	No
v ₃ or v _{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v ₃ or v _{av34} > 2700 pc/h?		No	
Is v ₃ or v _{av34} > 1.5 v ₁₂ / 2		No	
If yes, v _{12A} = 2164		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v _{R12}	2233	4600	No

Level of Service Determination (if not F)

Density, D = $5.475 + 0.00734 v_R + 0.0078 v_A - 0.00627 L$ = 17.8 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, M = 0.301

S

Space mean speed in ramp influence area, S_R = 61.6 mph

R

Space mean speed in outer lanes, S₀ = N/A mph

0

Space mean speed for all vehicles, S = 61.6 mph

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Jedburg Road (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.93
Shoulder width	2.5 ft	% Trucks and buses	11 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 352 veh/h
Opposing direction volume, Vo 562 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.3	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.968	0.989
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	391 pc/h	611 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	1.8	mi/h
Average travel speed, ATSD	34.0	mi/h
Percent Free Flow Speed, PFFS	78.1	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.989	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	383 pc/h	604 pc/h
Base percent time-spent-following,(note-4) BPTSFd	44.0	%
Adjustment for no-passing zones, fnp	36.1	
Percent time-spent-following, PTSFd	58.0	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.23
Peak 15-min vehicle-miles of travel, VMT15	95 veh-mi
Peak-hour vehicle-miles of travel, VMT60	352 veh-mi
Peak 15-min total travel time, TT15	2.8 veh-h
Capacity from ATS, CdATS	1681 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1681 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	34.0	mi/h
Percent time-spent-following, PTSFd (from above)	58.0	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 378.5
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 7.27
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Jedburg Road (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.94
Shoulder width	2.5 ft	% Trucks and buses	11 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	60 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 777 veh/h
Opposing direction volume, Vo 535 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.989	0.989
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	836 pc/h	575 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	1.4	mi/h
Average travel speed, ATSD	31.2	mi/h
Percent Free Flow Speed, PFFS	71.6	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	827 pc/h	569 pc/h
Base percent time-spent-following,(note-4) BPTSFd	67.7	%
Adjustment for no-passing zones, fnp	25.6	
Percent time-spent-following, PTSFd	82.9	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.49
Peak 15-min vehicle-miles of travel, VMT15	207 veh-mi
Peak-hour vehicle-miles of travel, VMT60	777 veh-mi
Peak 15-min total travel time, TT15	6.6 veh-h
Capacity from ATS, CdATS	1681 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1681 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	31.2	mi/h
Percent time-spent-following, PTSFd (from above)	82.9	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 826.6
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 7.66
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Volvo Car Drive (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	6.0 ft	% Trucks and buses	10 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	20 %
Up/down	- %	Access point density	8 /mi

Analysis direction volume, Vd 492 veh/h
Opposing direction volume, Vo 112 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.2	1.8
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.980	0.926
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	546 pc/h	131 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 0.0 mi/h
Adj. for access point density,(note-3) fA 2.0 mi/h

Free-flow speed, FFSd	48.0	mi/h
Adjustment for no-passing zones, fnp	0.4	mi/h
Average travel speed, ATSD	42.3	mi/h
Percent Free Flow Speed, PFFS	88.1	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	0.990
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	535 pc/h	123 pc/h
Base percent time-spent-following,(note-4) BPTSFd	46.9	%
Adjustment for no-passing zones, fnp	21.6	
Percent time-spent-following, PTSFd	64.5	%

Level of Service and Other Performance Measures

Level of service, LOS	B
Volume to capacity ratio, v/c	0.32
Peak 15-min vehicle-miles of travel, VMT15	134 veh-mi
Peak-hour vehicle-miles of travel, VMT60	492 veh-mi
Peak 15-min total travel time, TT15	3.2 veh-h
Capacity from ATS, CdATS	1574 veh/h
Capacity from PTSF, CdPTSF	1683 veh/h
Directional Capacity	1574 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	42.3	mi/h
Percent time-spent-following, PTSFd (from above)	64.5	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 534.8
Effective width of outside lane, We 24.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.13
Bicycle LOS E

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 27 (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.93
Shoulder width	1.0 ft	% Trucks and buses	16 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	30 /mi

Analysis direction volume, Vd 415 veh/h
Opposing direction volume, Vo 379 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.3	1.3
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.954	0.954
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	468 pc/h	427 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 7.5 mi/h

Free-flow speed, FFSd	43.3	mi/h
Adjustment for no-passing zones, fnp	2.6	mi/h
Average travel speed, ATSD	33.8	mi/h
Percent Free Flow Speed, PFFS	78.0	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	446 pc/h	408 pc/h
Base percent time-spent-following,(note-4) BPTSFd	45.4	%
Adjustment for no-passing zones, fnp	43.9	
Percent time-spent-following, PTSFd	68.3	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.27
Peak 15-min vehicle-miles of travel, VMT15	112 veh-mi
Peak-hour vehicle-miles of travel, VMT60	415 veh-mi
Peak 15-min total travel time, TT15	3.3 veh-h
Capacity from ATS, CdATS	1622 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1622 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	33.8	mi/h
Percent time-spent-following, PTSFd (from above)	68.3	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 446.2
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 9.87
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 27 (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.91
Shoulder width	2.5 ft	% Trucks and buses	16 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	10 /mi

Analysis direction volume, Vd 526 veh/h
Opposing direction volume, Vo 363 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.3
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.984	0.954
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	587 pc/h	418 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 2.5 mi/h

Free-flow speed, FFSd	49.5	mi/h
Adjustment for no-passing zones, fnp	2.6	mi/h
Average travel speed, ATSD	39.1	mi/h
Percent Free Flow Speed, PFFS	78.9	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	0.984
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	578 pc/h	405 pc/h
Base percent time-spent-following,(note-4) BPTSFd	53.9	%
Adjustment for no-passing zones, fnp	37.4	
Percent time-spent-following, PTSFd	75.9	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.35
Peak 15-min vehicle-miles of travel, VMT15	145 veh-mi
Peak-hour vehicle-miles of travel, VMT60	526 veh-mi
Peak 15-min total travel time, TT15	3.7 veh-h
Capacity from ATS, CdATS	1622 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1622 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	39.1	mi/h
Percent time-spent-following, PTSFd (from above)	75.9	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 578.0
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 9.87
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
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Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 453 (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	1.0 ft	% Trucks and buses	36 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	75 %
Up/down	- %	Access point density	4 /mi

Analysis direction volume, Vd 196 veh/h
Opposing direction volume, Vo 127 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.5	1.7
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.847	0.799
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	252 pc/h	173 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.7 mi/h
Adj. for access point density,(note-3) fA 1.0 mi/h

Free-flow speed, FFSd	39.3	mi/h
Adjustment for no-passing zones, fnp	3.2	mi/h
Average travel speed, ATSD	32.8	mi/h
Percent Free Flow Speed, PFFS	83.4	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.965	0.965
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	221 pc/h	143 pc/h
Base percent time-spent-following,(note-4) BPTSFd	23.5	%
Adjustment for no-passing zones, fnp	53.7	
Percent time-spent-following, PTSFd	56.1	%

Level of Service and Other Performance Measures

Level of service, LOS	B
Volume to capacity ratio, v/c	0.15
Peak 15-min vehicle-miles of travel, VMT15	53 veh-mi
Peak-hour vehicle-miles of travel, VMT60	196 veh-mi
Peak 15-min total travel time, TT15	1.6 veh-h
Capacity from ATS, CdATS	1358 veh/h
Capacity from PTSF, CdPTSF	1641 veh/h
Directional Capacity	1358 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.8	mi/h
Percent time-spent-following, PTSFd (from above)	56.1	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 213.0
Effective width of outside lane, We 12.50
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 24.27
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 453 (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	36 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	70 %
Up/down	- %	Access point density	16 /mi

Analysis direction volume, Vd 190 veh/h
Opposing direction volume, Vo 159 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.5	1.6
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.847	0.822
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	249 pc/h	215 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 4.0 mi/h

Free-flow speed, FFSd	36.8	mi/h
Adjustment for no-passing zones, fnp	3.4	mi/h
Average travel speed, ATSD	29.8	mi/h
Percent Free Flow Speed, PFFS	81.1	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.965	0.965
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	219 pc/h	183 pc/h
Base percent time-spent-following,(note-4) BPTSFd	23.3	%
Adjustment for no-passing zones, fnp	58.9	
Percent time-spent-following, PTSFd	55.4	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.15
Peak 15-min vehicle-miles of travel, VMT15	53 veh-mi
Peak-hour vehicle-miles of travel, VMT60	190 veh-mi
Peak 15-min total travel time, TT15	1.8 veh-h
Capacity from ATS, CdATS	1397 veh/h
Capacity from PTSF, CdPTSF	1641 veh/h
Directional Capacity	1397 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	29.8	mi/h
Percent time-spent-following, PTSFd (from above)	55.4	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 211.1
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 24.20
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Jedburg Road (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.93
Shoulder width	2.5 ft	% Trucks and buses	11 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 562 veh/h
Opposing direction volume, Vo 352 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.3
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.989	0.968
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	611 pc/h	391 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	2.8	mi/h
Average travel speed, ATSD	33.0	mi/h
Percent Free Flow Speed, PFFS	75.8	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	0.989
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	604 pc/h	383 pc/h
Base percent time-spent-following,(note-4) BPTSFd	54.8	%
Adjustment for no-passing zones, fnp	36.1	
Percent time-spent-following, PTSFd	76.9	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.36
Peak 15-min vehicle-miles of travel, VMT15	151 veh-mi
Peak-hour vehicle-miles of travel, VMT60	562 veh-mi
Peak 15-min total travel time, TT15	4.6 veh-h
Capacity from ATS, CdATS	1646 veh/h
Capacity from PTSF, CdPTSF	1682 veh/h
Directional Capacity	1646 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	33.0	mi/h
Percent time-spent-following, PTSFd (from above)	76.9	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 604.3
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 7.50
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Jedburg Road (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.94
Shoulder width	2.5 ft	% Trucks and buses	11 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	60 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 535 veh/h
Opposing direction volume, Vo 777 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.989	0.989
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	575 pc/h	836 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	0.8	mi/h
Average travel speed, ATSD	31.8	mi/h
Percent Free Flow Speed, PFFS	73.1	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	569 pc/h	827 pc/h
Base percent time-spent-following,(note-4) BPTSFd	59.4	%
Adjustment for no-passing zones, fnp	25.6	
Percent time-spent-following, PTSFd	69.8	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.34
Peak 15-min vehicle-miles of travel, VMT15	142 veh-mi
Peak-hour vehicle-miles of travel, VMT60	535 veh-mi
Peak 15-min total travel time, TT15	4.5 veh-h
Capacity from ATS, CdATS	1681 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1681 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	31.8	mi/h
Percent time-spent-following, PTSFd (from above)	69.8	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 569.1
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 7.47
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Volvo Car Drive (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	6.0 ft	% Trucks and buses	10 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	20 %
Up/down	- %	Access point density	8 /mi

Analysis direction volume, Vd 112 veh/h
Opposing direction volume, Vo 492 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.8	1.2
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.926	0.980
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	131 pc/h	546 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 0.0 mi/h
Adj. for access point density,(note-3) fA 2.0 mi/h

Free-flow speed, FFSd	48.0	mi/h
Adjustment for no-passing zones, fnp	0.7	mi/h
Average travel speed, ATSD	42.1	mi/h
Percent Free Flow Speed, PFFS	87.7	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.990	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	123 pc/h	535 pc/h
Base percent time-spent-following,(note-4) BPTSFd	18.7	%
Adjustment for no-passing zones, fnp	21.6	
Percent time-spent-following, PTSFd	22.7	%

Level of Service and Other Performance Measures

Level of service, LOS	B
Volume to capacity ratio, v/c	0.08
Peak 15-min vehicle-miles of travel, VMT15	30 veh-mi
Peak-hour vehicle-miles of travel, VMT60	112 veh-mi
Peak 15-min total travel time, TT15	0.7 veh-h
Capacity from ATS, CdATS	1666 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1666 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	42.1	mi/h
Percent time-spent-following, PTSFd (from above)	22.7	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 121.7
Effective width of outside lane, We 31.92
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 2.16
Bicycle LOS B

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 27 (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.93
Shoulder width	1.0 ft	% Trucks and buses	16 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	30 /mi

Analysis direction volume, Vd 379 veh/h
Opposing direction volume, Vo 415 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.3	1.3
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.954	0.954
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	427 pc/h	468 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 7.5 mi/h

Free-flow speed, FFSd	43.3	mi/h
Adjustment for no-passing zones, fnp	2.4	mi/h
Average travel speed, ATSD	34.0	mi/h
Percent Free Flow Speed, PFFS	78.4	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	408 pc/h	446 pc/h
Base percent time-spent-following,(note-4) BPTSFd	45.0	%
Adjustment for no-passing zones, fnp	43.9	
Percent time-spent-following, PTSFd	66.0	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.25
Peak 15-min vehicle-miles of travel, VMT15	102 veh-mi
Peak-hour vehicle-miles of travel, VMT60	379 veh-mi
Peak 15-min total travel time, TT15	3.0 veh-h
Capacity from ATS, CdATS	1622 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1622 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	34.0	mi/h
Percent time-spent-following, PTSFd (from above)	66.0	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 407.5
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 9.83
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 27 (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.91
Shoulder width	2.5 ft	% Trucks and buses	16 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	10 /mi

Analysis direction volume, Vd 363 veh/h
Opposing direction volume, Vo 526 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.3	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.954	0.984
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	418 pc/h	587 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 2.5 mi/h

Free-flow speed, FFSd	49.5	mi/h
Adjustment for no-passing zones, fnp	1.9	mi/h
Average travel speed, ATSD	39.8	mi/h
Percent Free Flow Speed, PFFS	80.3	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.984	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	405 pc/h	578 pc/h
Base percent time-spent-following,(note-4) BPTSFd	46.0	%
Adjustment for no-passing zones, fnp	37.4	
Percent time-spent-following, PTSFd	61.4	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.25
Peak 15-min vehicle-miles of travel, VMT15	100 veh-mi
Peak-hour vehicle-miles of travel, VMT60	363 veh-mi
Peak 15-min total travel time, TT15	2.5 veh-h
Capacity from ATS, CdATS	1673 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1673 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	39.8	mi/h
Percent time-spent-following, PTSFd (from above)	61.4	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 398.9
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 9.68
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 453 (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	1.0 ft	% Trucks and buses	36 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	75 %
Up/down	- %	Access point density	4 /mi

Analysis direction volume, Vd 127 veh/h
Opposing direction volume, Vo 196 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.7	1.5
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.799	0.847
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	173 pc/h	252 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.7 mi/h
Adj. for access point density,(note-3) fA 1.0 mi/h

Free-flow speed, FFSd	39.3	mi/h
Adjustment for no-passing zones, fnp	3.3	mi/h
Average travel speed, ATSD	32.7	mi/h
Percent Free Flow Speed, PFFS	83.2	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.965	0.965
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	143 pc/h	221 pc/h
Base percent time-spent-following,(note-4) BPTSFd	16.7	%
Adjustment for no-passing zones, fnp	53.7	
Percent time-spent-following, PTSFd	37.8	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.10
Peak 15-min vehicle-miles of travel, VMT15	35 veh-mi
Peak-hour vehicle-miles of travel, VMT60	127 veh-mi
Peak 15-min total travel time, TT15	1.1 veh-h
Capacity from ATS, CdATS	1440 veh/h
Capacity from PTSF, CdPTSF	1641 veh/h
Directional Capacity	1440 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.7	mi/h
Percent time-spent-following, PTSFd (from above)	37.8	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 138.0
Effective width of outside lane, We 17.06
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 23.38
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 453 (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	36 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	70 %
Up/down	- %	Access point density	16 /mi

Analysis direction volume, Vd 159 veh/h
Opposing direction volume, Vo 190 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.6	1.5
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.822	0.847
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	215 pc/h	249 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 4.0 mi/h

Free-flow speed, FFSd	36.8	mi/h
Adjustment for no-passing zones, fnp	3.2	mi/h
Average travel speed, ATSD	30.0	mi/h
Percent Free Flow Speed, PFFS	81.6	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.965	0.965
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	183 pc/h	219 pc/h
Base percent time-spent-following,(note-4) BPTSFd	20.7	%
Adjustment for no-passing zones, fnp	58.9	
Percent time-spent-following, PTSFd	47.5	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.13
Peak 15-min vehicle-miles of travel, VMT15	44 veh-mi
Peak-hour vehicle-miles of travel, VMT60	159 veh-mi
Peak 15-min total travel time, TT15	1.5 veh-h
Capacity from ATS, CdATS	1440 veh/h
Capacity from PTSF, CdPTSF	1641 veh/h
Directional Capacity	1440 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	30.0	mi/h
Percent time-spent-following, PTSFd (from above)	47.5	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 176.7
Effective width of outside lane, We 15.66
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 23.73
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2010	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	31	vph
Length of first accel/decel lane	465	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	163	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2010	31	163	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v ₁₅	546	9	45	v
Trucks and buses	10	52	24	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.952	0.794	0.893	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	2294	43	203	pcph

Estimation of V₁₂ Diverge Areas

L = (Equation 13-12 or 13-13)

EQ

P = 1.000 Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 2294$ pc/h

12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	2294	4800	No
$v_{12} = v_F - v_R$	2251	4800	No
$v_{12} = v_R$	43	2000	No
v_{12} or v_{12}	0 pc/h	(Equation 13-14 or 13-17)	
3 av ₃₄			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
3 av ₃₄			
Is v_{12} or v_{12}	> 1.5 v ₁₂ / 2	No	
3 av ₃₄	12		
If yes, v ₁₂ = 2294	(Equation 13-15, 13-16, 13-18, or 13-19)		
12A			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v ₁₂	2294	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 19.8$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.432$

S

Space mean speed in ramp influence area, $S = 57.9$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 57.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: Between SC 27 Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2030	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	23	vph
Length of first accel/decel lane	650	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	650	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1450	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2030	23	650	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v_{15}	552	6	181	v
Trucks and buses	10	8	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.962	0.966	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2317	27	747	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.701$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 1632$ pc/h

$v_{12} = 1632$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	2317	7200	No
$v_{12} = v_F - v_R$	2290	7200	No
$v_{12} = v_R$	27	2000	No
v_{12} or v_{12}	685 pc/h	(Equation 13-14 or 13-17)	
Is v_{12} or $v_{12} > 2700$ pc/h?		No	
Is v_{12} or $v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 1632$	(Equation 13-15, 13-16, 13-18, or 13-19)		
$v_{12} = 1632$			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1632	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 12.4$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.430$

S

Space mean speed in ramp influence area, $S = 57.9$ mph

R

Space mean speed in outer lanes, S = 76.8 mph

0

Space mean speed for all vehicles, S = 62.5 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2142	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	112	vph
Length of first accel/decel lane	250	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	23	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1600	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2142	112	23	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v_{15}	582	31	6	v
Trucks and buses	10	8	8	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.962	0.962	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2445	129	27	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.693$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 1734$ pc/h

v_{12} R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
v = v Fi F	2445	7200	No
v = v - v FO F R	2316	7200	No
v R	129	2000	No
v or v 3 av34	711 pc/h	(Equation 13-14 or 13-17)	
Is v or v 3 av34 > 2700 pc/h?		No	
Is v or v 3 av34 > 1.5 v /2		No	
	12		
If yes, v = 1734 12A		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1734	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 16.9$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.440$

S

Space mean speed in ramp influence area, $S = 57.7$ mph

R

Space mean speed in outer lanes, S = 76.8 mph

0

Space mean speed for all vehicles, S = 62.2 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2526	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	31	vph
Length of first accel/decel lane	1200	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	378	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	3500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2526	31	378	vph
Peak-hour factor, PHF	0.92	0.92	0.92	

Peak 15-min volume, v ₁₅	686	8	103	v
Trucks and buses	10	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.952	0.952	0.952	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	2883	35	431	pcph

Estimation of V₁₂ Diverge Areas

L = (Equation 13-12 or 13-13)

EQ

P = 0.686 Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 1990$ pc/h

12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
v = v Fi F	2883	7200	No
v = v - v FO F R	2848	7200	No
v R	35	2000	No
v or v 3 av34	893 pc/h	(Equation 13-14 or 13-17)	
Is v or v 3 av34	> 2700 pc/h?	No	
Is v or v 3 av34	> 1.5 v /2	No	
	12		
If yes, v = 1990 12A	(Equation 13-15, 13-16, 13-18, or 13-19)		

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1990	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 10.6$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.431$

S

Space mean speed in ramp influence area, $S = 57.9$ mph

R

Space mean speed in outer lanes, S = 76.8 mph

0

Space mean speed for all vehicles, S = 62.7 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2873	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	158	vph
Length of first accel/decel lane	180	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	644	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2900	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2873	158	644	vph
Peak-hour factor, PHF	0.92	0.91	0.90	

Peak 15-min volume, v_{15}	781	43	179	v
Trucks and buses	10	19	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.913	0.966	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3279	190	741	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.669$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 2257$ pc/h

$v_{12} = 2257$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	3279	7200	No
$v_{12} = v_F + (v_R - v_F) P$	3089	7200	No
$v_{12} = v_R$	190	2000	No
$v_{12} = v_F$ or $v_{12} = v_R$	1022 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} > 2700$ pc/h?	No		
Is $v_{12} > 1.5 v_F / 2$	No		
If yes, $v_{12} = 2257$	(Equation 13-15, 13-16, 13-18, or 13-19)		

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2257	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 22.0$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.445$

S

Space mean speed in ramp influence area, $S = 57.5$ mph

R

Space mean speed in outer lanes, S = 76.7 mph

0

Space mean speed for all vehicles, S = 62.4 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3490	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	627	vph
Length of first accel/decel lane	850	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	155	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	750	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3490	627	155	vph
Peak-hour factor, PHF	0.93	0.95	0.90	

Peak 15-min volume, v_{15}	938	165	43	v
Trucks and buses	15	6	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.971	0.966	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	4034	680	178	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.628$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 2786$ pc/h

$v_{12} = 2786$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	4034	7200	No
$v_{12} = v_F - v_R$	3354	7200	No
$v_{12} = v_R$	680	2000	No
$v_{12} \text{ or } v_{12}$	1248 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_{12} > 2700$ pc/h?		No	
Is $v_{12} \text{ or } v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 2786$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2786	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 20.6$ pc/mi/ln

$D = 20.6$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.489$

S

Space mean speed in ramp influence area, $S = 56.3$ mph

R

Space mean speed in outer lanes, S = 75.8 mph

0

Space mean speed for all vehicles, S = 61.2 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3767	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	277	vph
Length of first accel/decel lane	150	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	627	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	920	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3767	277	627	vph
Peak-hour factor, PHF	0.93	0.95	0.95	

Peak 15-min volume, v_{15}	1013	73	165	v
Trucks and buses	15	6	6	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	4354	300	680	pcph

Estimation of V12 Diverge Areas

$$L = 755.98 \text{ (Equation 13-12 or 13-13)}$$

EQ

$$P = 0.637 \text{ Using Equation 5}$$

FD

$$v_{12} = v_F + (v_R - v_F) P = 2884 \text{ pc/h}$$

12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$v = v$ Fi F	4354	7200	No
$v = v - v$ FO F R	4054	7200	No
v R	300	2000	No
$v \text{ or } v$ 3 av34	1470 pc/h	(Equation 13-14 or 13-17)	
Is $v \text{ or } v$ 3 av34	> 2700 pc/h?		No
Is $v \text{ or } v$ 3 av34	> 1.5 v /2		No
	12		
If yes, $v = 2884$ 12A	(Equation 13-15, 13-16, 13-18, or 13-19)		

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2884	4400	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L = 27.7 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

$$\text{Intermediate speed variable, } D = 0.455$$

S

$$\text{Space mean speed in ramp influence area, } S = 57.3 \text{ mph}$$

R

Space mean speed in outer lanes, S = 75.0 mph

0

Space mean speed for all vehicles, S = 62.2 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3018	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	124	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane	1500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	94	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3018	124	94	vph
Peak-hour factor, PHF	0.93	0.92	0.92	

Peak 15-min volume, v ₁₅	811	34	26	v
Trucks and buses	15	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.930	0.952	0.952	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	3489	142	107	pcph

Estimation of V₁₂ Diverge Areas

L = (Equation 13-12 or 13-13)

EQ

P = 0.450 Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 1648$ pc/h

12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$v_F = v_{12}$	3489	7200	No
$v_F = v_F - v_R$	3347	7200	No
v_R	142	4000	No
v_3 or v_{av34}	1841 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700$ pc/h?		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		Yes	
If yes, $v_{12A} = 1993$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	1993	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = -19.1$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable, $D = 0.441$

S

Space mean speed in ramp influence area, $S = 57.7$ mph

R

Space mean speed in outer lanes, S = 74.9 mph

0

Space mean speed for all vehicles, S = 64.0 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2701	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	221	vph
Length of first accel/decel lane	650	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	155	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1300	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2701	221	155	vph
Peak-hour factor, PHF	0.93	0.91	0.90	

Peak 15-min volume, v_{15}	726	61	43	v
Trucks and buses	15	7	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.966	0.966	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3122	251	178	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.670$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 2176$ pc/h

$v_{12} = 2176$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	3122	7200	No
$v_{12} = v_F - v_R$	2871	7200	No
$v_{12} = v_F$	251	2000	No
$v_{12} \text{ or } v_{12}$	946 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_{12} > 2700$ pc/h?		No	
Is $v_{12} \text{ or } v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 2176$	(Equation 13-15, 13-16, 13-18, or 13-19)		

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2176	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 17.1$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.451$

S

Space mean speed in ramp influence area, $S = 57.4$ mph

R

Space mean speed in outer lanes, S = 76.8 mph

0

Space mean speed for all vehicles, S = 62.1 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2988	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	287	vph
Length of first accel/decel lane	250	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	221	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	1775	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2988	287	221	vph
Peak-hour factor, PHF	0.93	0.91	0.91	

Peak 15-min volume, v_{15}	803	79	61	v
Trucks and buses	15	7	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.966	0.966	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3454	326	251	pcph

Estimation of V12 Diverge Areas

$$L = 273.18 \text{ (Equation 13-12 or 13-13)}$$

EQ

$$P = 0.659 \text{ Using Equation 5}$$

FD

$$v_{12} = v_F + (v_R - v_F) P = 2386 \text{ pc/h}$$

12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	3454	7200	No
$v_{12} = v_F - v_R$	3128	7200	No
$v_{12} = v_F$	326	2000	No
$v_{12} \text{ or } v_{12}$	1068 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_{12} > 2700 \text{ pc/h?}$		No	
Is $v_{12} \text{ or } v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 2386$	(Equation 13-15, 13-16, 13-18, or 13-19)		
12A			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2386	4400	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L = 22.5 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

$$\text{Intermediate speed variable, } D = 0.457$$

S

$$\text{Space mean speed in ramp influence area, } S = 57.2 \text{ mph}$$

R

Space mean speed in outer lanes, S = 76.5 mph

0

Space mean speed for all vehicles, S = 62.0 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2635	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	166	vph
Length of first accel/decel lane	475	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	57	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2635	166	57	vph
Peak-hour factor, PHF	0.93	0.90	0.90	

Peak 15-min volume, v_{15}	708	46	16	v
Trucks and buses	15	21	24	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.905	0.893	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3046	204	71	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 3046$ pc/h

$v_{12} = 3046$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	3046	4800	No
$v_{12} = v_F - v_R$	2842	4800	No
$v_{12} = v_F$	204	2000	No
$v_{12} \text{ or } v_R$	0 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_R > 2700$ pc/h?		No	
Is $v_{12} \text{ or } v_R > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 3046$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3046	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 26.2$ pc/mi/ln

$D = 26.2$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.446$

S

Space mean speed in ramp influence area, $S = 57.5$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 57.5 mph

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: West of SC 453
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2010	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	546	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1147	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.2	mi/h
Free-flow speed, FFS	72.2	mi/h

LOS and Performance Measures

Flow rate, vp	1147	pc/h/ln
Free-flow speed, FFS	72.2	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	2	
Density, D	16.4	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Between SC 453 Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1979	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	538	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1129	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.33	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.3	mi/h
Free-flow speed, FFS	74.1	mi/h

LOS and Performance Measures

Flow rate, vp	1129	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	74.8	mi/h
Number of lanes, N	2	
Density, D	15.1	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: SC 453 to SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2142	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	582	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1222	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	1222	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	74.5	mi/h
Number of lanes, N	2	
Density, D	16.4	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Between SC 27 Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2007	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	545	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	764	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	764	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	10.2	pc/mi/ln
Level of service, LOS	A	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Between SC 27 Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2030	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	552	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	772	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	772	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	10.3	pc/mi/ln
Level of service, LOS	A	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Between SC 27 & Volvo
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2526	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	686	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	961	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, v_p	961	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	12.8	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Between Volvo Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2495	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	678	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	949	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	949	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	12.7	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Volvo to Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2873	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	781	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1093	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1093	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	74.9	mi/h
Number of lanes, N	3	
Density, D	14.6	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

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E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2715	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	738	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1033	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.50	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.8	mi/h
Free-flow speed, FFS	73.6	mi/h

LOS and Performance Measures

Flow rate, vp	1033	pc/h/ln
Free-flow speed, FFS	73.6	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	13.8	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Jedburg to Nexton
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3359	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	913	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1278	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.20	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.8	mi/h
Free-flow speed, FFS	71.6	mi/h

LOS and Performance Measures

Flow rate, vp	1278	pc/h/ln
Free-flow speed, FFS	71.6	mi/h
Average passenger-car speed, S	69.9	mi/h
Number of lanes, N	3	
Density, D	18.3	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

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Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Nexton to Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3767	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	1013	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1451	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.33	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	4.1	mi/h
Free-flow speed, FFS	71.3	mi/h

LOS and Performance Measures

Flow rate, vp	1451	pc/h/ln
Free-flow speed, FFS	71.3	mi/h
Average passenger-car speed, S	69.3	mi/h
Number of lanes, N	3	
Density, D	20.9	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2863	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	770	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1103	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1103	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	74.9	mi/h
Number of lanes, N	3	
Density, D	14.7	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
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Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3490	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	938	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1345	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1345	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	73.7	mi/h
Number of lanes, N	3	
Density, D	18.3	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Jedburg to Volvo
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3018	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	811	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1163	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	1163	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	74.7	mi/h
Number of lanes, N	3	
Density, D	15.6	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between Volvo Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2894	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	778	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1115	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	1115	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	74.9	mi/h
Number of lanes, N	3	
Density, D	14.9	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between Volvo & SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2988	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	803	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1151	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	1151	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	74.7	mi/h
Number of lanes, N	3	
Density, D	15.4	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between SC 27 Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2480	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	667	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	956	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	956	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	12.7	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between SC 27 Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2701	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	726	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1041	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	1041	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	13.9	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: SC 27 to SC 453
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2635	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	708	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1523	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	1523	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	72.0	mi/h
Number of lanes, N	2	
Density, D	21.2	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between SC 453 Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2469	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	664	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1427	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.33	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.3	mi/h
Free-flow speed, FFS	74.1	mi/h

LOS and Performance Measures

Flow rate, vp	1427	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	73.0	mi/h
Number of lanes, N	2	
Density, D	19.6	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: West of SC 453
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2526	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	679	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1460	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.2	mi/h
Free-flow speed, FFS	72.2	mi/h

LOS and Performance Measures

Flow rate, vp	1460	pc/h/ln
Free-flow speed, FFS	72.2	mi/h
Average passenger-car speed, S	69.2	mi/h
Number of lanes, N	2	
Density, D	21.1	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1979	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	163	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	31	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1979	163	31	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v_{15}	538	45	9	v
Trucks and buses	10	24	52	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.893	0.794	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2259	203	43	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)

EQ

$P = 1.000$ Using Equation 0

FM

$v_{12} = v_{12} (P) = 2259$ pc/h

FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	2462	4800	No
FO			
v_{12} or v_{12}	0 pc/h	(Equation 13-14 or 13-17)	
$\frac{v_{12}}{3}$ av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
$\frac{v_{12}}{3}$ av34			
Is v_{12} or v_{12}	$> 1.5 \frac{v_{12}}{12}$	No	
$\frac{v_{12}}{3}$ av34			
If yes, v_{12}	$= 2259$	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2462	4600	No
R12			

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 \frac{v_{12}}{R} + 0.0078 \frac{v_{12}}{A} - 0.00627 L = 19.6$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.311$

S

Space mean speed in ramp influence area, $S = 61.3$ mph

R

Space mean speed in outer lanes, $S = N/A$ mph

0

Space mean speed for all vehicles, $S = 61.3$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2007	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	519	vph
Length of first accel/decel lane	900	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	23	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1450	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2007	519	23	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v_{15}	545	144	6	v
Trucks and buses	10	7	8	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.966	0.962	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2291	597	27	pcph

Estimation of V12 Merge Areas

$$L = 445.83 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.603 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 1381 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	2888	7200	No
FO			
v_{12} or v_{12}	910 pc/h	(Equation 13-14 or 13-17)	
3 av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
3 av34			
Is v_{12} or v_{12}	> 1.5 $v_{12} / 2$	Yes	
3 av34	12		
If yes, v_{12}	= 1381	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	1978	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 15.0 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.286$

S

Space mean speed in ramp influence area, $S = 62.0$ mph

R

Space mean speed in outer lanes, $S = 68.5$ mph

0

Space mean speed for all vehicles, $S = 63.9$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2495	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-flow speed on ramp	35.0	mph
Volume on ramp	378	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane	1500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	31	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	3500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2495	378	31	vph
Peak-hour factor, PHF	0.92	0.92	0.92	

Peak 15-min volume, v_{15}	678	103	8	v
Trucks and buses	10	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2848	431	35	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)

EQ

$P = 0.555$ Using Equation 0

FM

$v_{12} = v_{12} (P) = 1581$ pc/h

FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	3279	7200	No
FO			
v_{12} or v_{12}	1267 pc/h	(Equation 13-14 or 13-17)	
v_{12} or v_{12}			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
Is v_{12} or v_{12}	$> 1.5 v_{12} / 2$	Yes	
If yes, v_{12}	$= 1627$	(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2058	4600	No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = -6.9$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable, $M = 0.037$

S

Space mean speed in ramp influence area, $S = 69.0$ mph

R

Space mean speed in outer lanes, $S = 67.4$ mph

0

Space mean speed for all vehicles, $S = 68.4$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2715	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	644	vph
Length of first accel/decel lane	1120	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	158	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2900	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2715	644	158	vph
Peak-hour factor, PHF	0.92	0.90	0.91	

Peak 15-min volume, v_{15}	738	179	43	v
Trucks and buses	10	7	19	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.966	0.913	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3099	741	190	pcph

Estimation of V12 Merge Areas

$$L = 747.24 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.609 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 1887 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	3840	7200	No
FO			
v_{12} or v_{12}	1212 pc/h	(Equation 13-14 or 13-17)	
3 av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
3 av34			
Is v_{12} or v_{12}	> 1.5 $v_{12} / 2$	Yes	
3 av34	12		
If yes, v_{12}	= 1887	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2628	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 18.6 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.297$

S

Space mean speed in ramp influence area, $S = 61.7 \text{ mph}$

R

Space mean speed in outer lanes, $S = 67.4 \text{ mph}$

0

Space mean speed for all vehicles, $S = 63.4 \text{ mph}$

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2863	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	155	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	627	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	750	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2863	155	627	vph
Peak-hour factor, PHF	0.93	0.90	0.95	

Peak 15-min volume, v_{15}	770	43	165	v
Trucks and buses	15	7	6	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.966	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3309	178	680	pcph

Estimation of V12 Merge Areas

$$L = 840.42 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.614 \text{ Using Equation 2}$$

FM

$$v_{12} = v_{12} (P) = 2031 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	3487	7200	No
FO			
v_{12} or v_{12}	1278 pc/h	(Equation 13-14 or 13-17)	
3 av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
3 av34			
Is v_{12} or v_{12}	> 1.5 $v_{12} / 2$	Yes	
3 av34	12		
If yes, v_{12}	= 2031	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2209	4600	No
12A			

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 13.2 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.252$

S

Space mean speed in ramp influence area, $S = 63.0$ mph

R

Space mean speed in outer lanes, $S = 67.2$ mph

0

Space mean speed for all vehicles, $S = 64.4$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2894	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	94	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	124	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2894	94	124	vph
Peak-hour factor, PHF	0.93	0.92	0.92	

Peak 15-min volume, v_{15}	778	26	34	v
Trucks and buses	15	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3345	107	142	pcph

Estimation of V12 Merge Areas

$$L = 832.93 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.619 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 2072 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	3452	7200	No
FO			
v_{12} or v_{12}	1273 pc/h	(Equation 13-14 or 13-17)	
3 av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
3 av34			
Is v_{12} or v_{12}	> 1.5 $v_{12} / 2$	Yes	
3 av34	12		
If yes, v_{12}	= 2072	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2179	4600	No
12A			

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 13.0 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.250$

S

Space mean speed in ramp influence area, $S = 63.0 \text{ mph}$

R

Space mean speed in outer lanes, $S = 67.2 \text{ mph}$

0

Space mean speed for all vehicles, $S = 64.5 \text{ mph}$

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2480	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	155	vph
Length of first accel/decel lane	900	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	221	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1300	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2480	155	221	vph
Peak-hour factor, PHF	0.93	0.90	0.91	

Peak 15-min volume, v_{15}	667	43	61	v
Trucks and buses	15	7	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.966	0.966	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2867	178	251	pcph

Estimation of V12 Merge Areas

$$L = 479.43 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.603 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 1728 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	3045	7200	No
FO			
v_{12} or v_{12}	1139 pc/h	(Equation 13-14 or 13-17)	
v_{12} or v_{12}			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
v_{12} or v_{12}			
Is v_{12} or v_{12}	> 1.5 v_{12} / 2	Yes	
v_{12} or v_{12}			
If yes, v_{12}	= 1728	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1906	4600	No
12A			

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 14.6 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.284$

S

Space mean speed in ramp influence area, $S = 62.0$ mph

R

Space mean speed in outer lanes, $S = 67.7$ mph

0

Space mean speed for all vehicles, $S = 64.0$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2469	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	57	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	166	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2469	57	166	vph
Peak-hour factor, PHF	0.93	0.90	0.90	

Peak 15-min volume, v_{15}	664	16	46	v
Trucks and buses	15	24	21	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.893	0.905	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2854	71	204	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)

EQ

$P = 1.000$ Using Equation 0

FM

$v_{12} = v_{12} (P) = 2854$ pc/h

FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	2925	4800	No
FO			
v_{12} or v_{12}	0 pc/h	(Equation 13-14 or 13-17)	
v_{12} or v_{12}			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
Is v_{12} or v_{12}	> 1.5 $v_{12} / 2$	No	
If yes, v_{12}	= 2854	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2925	4600	No
R12			

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 23.2$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $M = 0.338$

S

Space mean speed in ramp influence area, $S = 60.5$ mph

R

Space mean speed in outer lanes, $S = N/A$ mph

0

Space mean speed for all vehicles, $S = 60.5$ mph

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Jedburg Road (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.95
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 561 veh/h
Opposing direction volume, Vo 407 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.3
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.993	0.979
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	595 pc/h	438 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	2.5	mi/h
Average travel speed, ATSD	33.0	mi/h
Percent Free Flow Speed, PFFS	75.8	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	591 pc/h	428 pc/h
Base percent time-spent-following,(note-4) BPTSFd	56.4	%
Adjustment for no-passing zones, fnp	37.0	
Percent time-spent-following, PTSFd	77.9	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.35
Peak 15-min vehicle-miles of travel, VMT15	148 veh-mi
Peak-hour vehicle-miles of travel, VMT60	561 veh-mi
Peak 15-min total travel time, TT15	4.5 veh-h
Capacity from ATS, CdATS	1664 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1664 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	33.0	mi/h
Percent time-spent-following, PTSFd (from above)	77.9	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 590.5
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.95
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Jedburg Road (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	60 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 686 veh/h
Opposing direction volume, Vo 836 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.993	1.000
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	751 pc/h	909 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	0.7	mi/h
Average travel speed, ATSD	29.9	mi/h
Percent Free Flow Speed, PFFS	68.8	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	746 pc/h	909 pc/h
Base percent time-spent-following,(note-4) BPTSFd	68.2	%
Adjustment for no-passing zones, fnp	21.9	
Percent time-spent-following, PTSFd	78.1	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.44
Peak 15-min vehicle-miles of travel, VMT15	186 veh-mi
Peak-hour vehicle-miles of travel, VMT60	686 veh-mi
Peak 15-min total travel time, TT15	6.2 veh-h
Capacity from ATS, CdATS	1700 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1700 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	29.9	mi/h
Percent time-spent-following, PTSFd (from above)	78.1	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 745.7
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 6.07
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Volvo Car Drive (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	6.0 ft	% Trucks and buses	10 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	20 %
Up/down	- %	Access point density	8 /mi

Analysis direction volume, Vd 155 veh/h
Opposing direction volume, Vo 472 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.6	1.2
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.943	0.980
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	179 pc/h	524 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 0.0 mi/h
Adj. for access point density,(note-3) fA 2.0 mi/h

Free-flow speed, FFSd	48.0	mi/h
Adjustment for no-passing zones, fnp	0.7	mi/h
Average travel speed, ATSD	41.8	mi/h
Percent Free Flow Speed, PFFS	87.2	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.990	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	170 pc/h	513 pc/h
Base percent time-spent-following,(note-4) BPTSFd	24.0	%
Adjustment for no-passing zones, fnp	24.8	
Percent time-spent-following, PTSFd	30.2	%

Level of Service and Other Performance Measures

Level of service, LOS	B
Volume to capacity ratio, v/c	0.11
Peak 15-min vehicle-miles of travel, VMT15	42 veh-mi
Peak-hour vehicle-miles of travel, VMT60	155 veh-mi
Peak 15-min total travel time, TT15	1.0 veh-h
Capacity from ATS, CdATS	1666 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1666 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	41.8	mi/h
Percent time-spent-following, PTSFd (from above)	30.2	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 168.5
Effective width of outside lane, We 28.05
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 3.48
Bicycle LOS C

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 27 (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	7 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	30 /mi

Analysis direction volume, Vd 452 veh/h
Opposing direction volume, Vo 581 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.2	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.986	0.993
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	509 pc/h	650 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 7.5 mi/h

Free-flow speed, FFSd	43.3	mi/h
Adjustment for no-passing zones, fnp	1.6	mi/h
Average travel speed, ATSD	32.7	mi/h
Percent Free Flow Speed, PFFS	75.4	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	502 pc/h	646 pc/h
Base percent time-spent-following,(note-4) BPTSFd	53.3	%
Adjustment for no-passing zones, fnp	34.3	
Percent time-spent-following, PTSFd	68.3	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.30
Peak 15-min vehicle-miles of travel, VMT15	126 veh-mi
Peak-hour vehicle-miles of travel, VMT60	452 veh-mi
Peak 15-min total travel time, TT15	3.9 veh-h
Capacity from ATS, CdATS	1688 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1688 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.7	mi/h
Percent time-spent-following, PTSFd (from above)	68.3	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 502.2
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 6.01
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 27 (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	10 /mi

Analysis direction volume, Vd 414 veh/h
Opposing direction volume, Vo 504 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.2	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.986	0.993
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	467 pc/h	564 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 2.5 mi/h

Free-flow speed, FFSd	49.5	mi/h
Adjustment for no-passing zones, fnp	2.0	mi/h
Average travel speed, ATSD	39.5	mi/h
Percent Free Flow Speed, PFFS	79.7	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	460 pc/h	560 pc/h
Base percent time-spent-following,(note-4) BPTSFd	49.7	%
Adjustment for no-passing zones, fnp	38.1	
Percent time-spent-following, PTSFd	66.9	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.27
Peak 15-min vehicle-miles of travel, VMT15	115 veh-mi
Peak-hour vehicle-miles of travel, VMT60	414 veh-mi
Peak 15-min total travel time, TT15	2.9 veh-h
Capacity from ATS, CdATS	1688 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1688 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	39.5	mi/h
Percent time-spent-following, PTSFd (from above)	66.9	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 460.0
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.83
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 453 (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	24 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	75 %
Up/down	- %	Access point density	4 /mi

Analysis direction volume, Vd 156 veh/h
Opposing direction volume, Vo 180 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.6	1.5
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.874	0.893
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	198 pc/h	224 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.7 mi/h
Adj. for access point density,(note-3) fA 1.0 mi/h

Free-flow speed, FFSd	39.3	mi/h
Adjustment for no-passing zones, fnp	3.5	mi/h
Average travel speed, ATSD	32.6	mi/h
Percent Free Flow Speed, PFFS	82.8	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.977	0.977
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	177 pc/h	205 pc/h
Base percent time-spent-following,(note-4) BPTSFd	19.3	%
Adjustment for no-passing zones, fnp	59.3	
Percent time-spent-following, PTSFd	46.8	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.12
Peak 15-min vehicle-miles of travel, VMT15	43 veh-mi
Peak-hour vehicle-miles of travel, VMT60	156 veh-mi
Peak 15-min total travel time, TT15	1.3 veh-h
Capacity from ATS, CdATS	1518 veh/h
Capacity from PTSF, CdPTSF	1660 veh/h
Directional Capacity	1518 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.6	mi/h
Percent time-spent-following, PTSFd (from above)	46.8	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 173.3
Effective width of outside lane, We 15.25
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 13.97
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 453 (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	24 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	70 %
Up/down	- %	Access point density	16 /mi

Analysis direction volume, Vd 170 veh/h
Opposing direction volume, Vo 243 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.5	1.4
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.893	0.912
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	212 pc/h	296 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 4.0 mi/h

Free-flow speed, FFSd	36.8	mi/h
Adjustment for no-passing zones, fnp	2.9	mi/h
Average travel speed, ATSD	30.0	mi/h
Percent Free Flow Speed, PFFS	81.5	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.977	0.977
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	193 pc/h	276 pc/h
Base percent time-spent-following,(note-4) BPTSFd	22.7	%
Adjustment for no-passing zones, fnp	54.2	
Percent time-spent-following, PTSFd	45.0	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.12
Peak 15-min vehicle-miles of travel, VMT15	47 veh-mi
Peak-hour vehicle-miles of travel, VMT60	170 veh-mi
Peak 15-min total travel time, TT15	1.6 veh-h
Capacity from ATS, CdATS	1550 veh/h
Capacity from PTSF, CdPTSF	1660 veh/h
Directional Capacity	1550 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	30.0	mi/h
Percent time-spent-following, PTSFd (from above)	45.0	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 188.9
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 14.33
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Jedburg Road (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.95
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 407 veh/h
Opposing direction volume, Vo 561 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.3	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.979	0.993
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	438 pc/h	595 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	1.8	mi/h
Average travel speed, ATSD	33.7	mi/h
Percent Free Flow Speed, PFFS	77.4	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	428 pc/h	591 pc/h
Base percent time-spent-following,(note-4) BPTSFd	47.8	%
Adjustment for no-passing zones, fnp	37.0	
Percent time-spent-following, PTSFd	63.3	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.26
Peak 15-min vehicle-miles of travel, VMT15	107 veh-mi
Peak-hour vehicle-miles of travel, VMT60	407 veh-mi
Peak 15-min total travel time, TT15	3.2 veh-h
Capacity from ATS, CdATS	1688 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1688 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	33.7	mi/h
Percent time-spent-following, PTSFd (from above)	63.3	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 428.4
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.79
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Jedburg Road (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	60 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 836 veh/h
Opposing direction volume, Vo 686 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	1.000	0.993
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	909 pc/h	751 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	0.9	mi/h
Average travel speed, ATSD	29.7	mi/h
Percent Free Flow Speed, PFFS	68.3	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	909 pc/h	746 pc/h
Base percent time-spent-following,(note-4) BPTSFd	73.0	%
Adjustment for no-passing zones, fnp	21.9	
Percent time-spent-following, PTSFd	85.0	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.53
Peak 15-min vehicle-miles of travel, VMT15	227 veh-mi
Peak-hour vehicle-miles of travel, VMT60	836 veh-mi
Peak 15-min total travel time, TT15	7.6 veh-h
Capacity from ATS, CdATS	1688 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1688 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	29.7	mi/h
Percent time-spent-following, PTSFd (from above)	85.0	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 908.7
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 6.17
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Volvo Car Drive (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	6.0 ft	% Trucks and buses	10 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	20 %
Up/down	- %	Access point density	8 /mi

Analysis direction volume, Vd 472 veh/h
Opposing direction volume, Vo 155 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.2	1.6
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.980	0.943
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	524 pc/h	179 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 0.0 mi/h
Adj. for access point density,(note-3) fA 2.0 mi/h

Free-flow speed, FFSd	48.0	mi/h
Adjustment for no-passing zones, fnp	0.9	mi/h
Average travel speed, ATSD	41.7	mi/h
Percent Free Flow Speed, PFFS	86.8	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	0.990
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	513 pc/h	170 pc/h
Base percent time-spent-following,(note-4) BPTSFd	45.5	%
Adjustment for no-passing zones, fnp	24.8	
Percent time-spent-following, PTSFd	64.1	%

Level of Service and Other Performance Measures

Level of service, LOS	B
Volume to capacity ratio, v/c	0.31
Peak 15-min vehicle-miles of travel, VMT15	128 veh-mi
Peak-hour vehicle-miles of travel, VMT60	472 veh-mi
Peak 15-min total travel time, TT15	3.1 veh-h
Capacity from ATS, CdATS	1603 veh/h
Capacity from PTSF, CdPTSF	1683 veh/h
Directional Capacity	1603 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	41.7	mi/h
Percent time-spent-following, PTSFd (from above)	64.1	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 513.0
Effective width of outside lane, We 24.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.10
Bicycle LOS E

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 27 (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	7 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	30 /mi

Analysis direction volume, Vd 581 veh/h
Opposing direction volume, Vo 452 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.2
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.993	0.986
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	650 pc/h	509 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 7.5 mi/h

Free-flow speed, FFSd	43.3	mi/h
Adjustment for no-passing zones, fnp	2.2	mi/h
Average travel speed, ATSD	32.1	mi/h
Percent Free Flow Speed, PFFS	74.1	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	646 pc/h	502 pc/h
Base percent time-spent-following,(note-4) BPTSFd	60.3	%
Adjustment for no-passing zones, fnp	34.3	
Percent time-spent-following, PTSFd	79.6	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.38
Peak 15-min vehicle-miles of travel, VMT15	161 veh-mi
Peak-hour vehicle-miles of travel, VMT60	581 veh-mi
Peak 15-min total travel time, TT15	5.0 veh-h
Capacity from ATS, CdATS	1676 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1676 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.1	mi/h
Percent time-spent-following, PTSFd (from above)	79.6	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 645.6
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 6.13
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 27 (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	10 /mi

Analysis direction volume, Vd 504 veh/h
Opposing direction volume, Vo 414 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.2
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.993	0.986
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	564 pc/h	467 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 2.5 mi/h

Free-flow speed, FFSd	49.5	mi/h
Adjustment for no-passing zones, fnp	2.4	mi/h
Average travel speed, ATSD	39.1	mi/h
Percent Free Flow Speed, PFFS	78.9	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	560 pc/h	460 pc/h
Base percent time-spent-following,(note-4) BPTSFd	54.0	%
Adjustment for no-passing zones, fnp	38.1	
Percent time-spent-following, PTSFd	74.9	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.33
Peak 15-min vehicle-miles of travel, VMT15	140 veh-mi
Peak-hour vehicle-miles of travel, VMT60	504 veh-mi
Peak 15-min total travel time, TT15	3.6 veh-h
Capacity from ATS, CdATS	1676 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1676 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	39.1	mi/h
Percent time-spent-following, PTSFd (from above)	74.9	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 560.0
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.93
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 453 (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	24 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	75 %
Up/down	- %	Access point density	4 /mi

Analysis direction volume, Vd 180 veh/h
Opposing direction volume, Vo 156 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.5	1.6
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.893	0.874
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	224 pc/h	198 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.7 mi/h
Adj. for access point density,(note-3) fA 1.0 mi/h

Free-flow speed, FFSd	39.3	mi/h
Adjustment for no-passing zones, fnp	3.6	mi/h
Average travel speed, ATSD	32.4	mi/h
Percent Free Flow Speed, PFFS	82.5	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.977	0.977
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	205 pc/h	177 pc/h
Base percent time-spent-following,(note-4) BPTSFd	22.0	%
Adjustment for no-passing zones, fnp	59.3	
Percent time-spent-following, PTSFd	53.8	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.13
Peak 15-min vehicle-miles of travel, VMT15	50 veh-mi
Peak-hour vehicle-miles of travel, VMT60	180 veh-mi
Peak 15-min total travel time, TT15	1.5 veh-h
Capacity from ATS, CdATS	1486 veh/h
Capacity from PTSF, CdPTSF	1660 veh/h
Directional Capacity	1486 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.4	mi/h
Percent time-spent-following, PTSFd (from above)	53.8	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 200.0
Effective width of outside lane, We 12.50
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 14.42
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 453 (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	24 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	70 %
Up/down	- %	Access point density	16 /mi

Analysis direction volume, Vd 243 veh/h
Opposing direction volume, Vo 170 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.4	1.5
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.912	0.893
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	296 pc/h	212 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 4.0 mi/h

Free-flow speed, FFSd	36.8	mi/h
Adjustment for no-passing zones, fnp	3.4	mi/h
Average travel speed, ATSD	29.5	mi/h
Percent Free Flow Speed, PFFS	80.1	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.977	0.977
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	276 pc/h	193 pc/h
Base percent time-spent-following,(note-4) BPTSFd	28.3	%
Adjustment for no-passing zones, fnp	54.2	
Percent time-spent-following, PTSFd	60.2	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.17
Peak 15-min vehicle-miles of travel, VMT15	68 veh-mi
Peak-hour vehicle-miles of travel, VMT60	243 veh-mi
Peak 15-min total travel time, TT15	2.3 veh-h
Capacity from ATS, CdATS	1518 veh/h
Capacity from PTSF, CdPTSF	1660 veh/h
Directional Capacity	1518 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	29.5	mi/h
Percent time-spent-following, PTSFd (from above)	60.2	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 270.0
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 14.51
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

June 2019

C.7 2043 BUILD – ALTERNATIVE 2



HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1991	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	67	vph
Length of first accel/decel lane	465	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	171	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1991	67	171	vph
Peak-hour factor, PHF	0.91	0.95	0.90	

Peak 15-min volume, v_{15}	547	18	48	v
Trucks and buses	24	53	36	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.791	0.847	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2450	89	224	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 2450$ pc/h

$v_{12} = 2450$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	2450	4800	No
$v_{12} = v_F - v_R$	2361	4800	No
$v_{12} = v_F$	89	2000	No
$v_{12} \text{ or } v_R$	0 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_R > 2700$ pc/h?		No	
Is $v_{12} \text{ or } v_R > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 2450$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2450	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 21.1$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.436$

S

Space mean speed in ramp influence area, $S = 57.8$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 57.8 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1973	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	47	vph
Length of first accel/decel lane	650	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	670	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1450	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1973	47	670	vph
Peak-hour factor, PHF	0.91	0.90	0.90	

Peak 15-min volume, v_{15}	542	13	186	v
Trucks and buses	24	23	16	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.897	0.926	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2428	58	804	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.697$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 1709$ pc/h

$v_{12} = 1709$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	2428	7200	No
$v_{12} = v_F$			
$v_{12} = v_F - v_R$	2370	7200	No
$v_{12} = v_F - v_R$			
$v_{12} = v_R$	58	2000	No
$v_{12} = v_R$			
$v_{12} = v_F$ or $v_{12} = v_R$	719 pc/h	(Equation 13-14 or 13-17)	
$v_{12} = v_F$ or $v_{12} = v_R$			
Is $v_{12} = v_F$ or $v_{12} = v_R$ > 2700 pc/h?		No	
Is $v_{12} = v_F$ or $v_{12} = v_R$ > 1.5 $v_{12} / 2$		No	
If yes, $v_{12} = 1709$	(Equation 13-15, 13-16, 13-18, or 13-19)		
$v_{12} = 1709$			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1709	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 13.1$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.433$

S

Space mean speed in ramp influence area, $S = 57.9$ mph

R

Space mean speed in outer lanes, S = 76.8 mph

0

Space mean speed for all vehicles, S = 62.4 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2095	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	122	vph
Length of first accel/decel lane	250	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	47	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	1600	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2095	122	47	vph
Peak-hour factor, PHF	0.91	0.90	0.90	

Peak 15-min volume, v_{15}	576	34	13	v
Trucks and buses	24	23	23	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.897	0.897	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2578	151	58	pcph

Estimation of V12 Diverge Areas

$$L = 57.34 \text{ (Equation 13-12 or 13-13)}$$

EQ

$$P = 0.689 \text{ Using Equation 5}$$

FD

$$v_{12} = v_F + (v_R - v_F) P = 1822 \text{ pc/h}$$

12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	2578	7200	No
$v_{12} = v_F - v_R$	2427	7200	No
$v_{12} = v_F$	151	2000	No
$v_{12} \text{ or } v_{12}$	756 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_{12} > 2700 \text{ pc/h?}$		No	
Is $v_{12} \text{ or } v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 1822$	(Equation 13-15, 13-16, 13-18, or 13-19)		
12A			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1822	4400	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L = 17.7 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

$$\text{Intermediate speed variable, } D = 0.442$$

S

$$\text{Space mean speed in ramp influence area, } S = 57.6 \text{ mph}$$

R

Space mean speed in outer lanes, S = 76.8 mph

0

Space mean speed for all vehicles, S = 62.2 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2613	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	186	vph
Length of first accel/decel lane	1200	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	500	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	3500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2613	186	500	vph
Peak-hour factor, PHF	0.91	0.92	0.92	

Peak 15-min volume, v_{15}	718	51	136	v
Trucks and buses	24	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3216	212	571	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.670$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 2224$ pc/h

$v_{12} = 2224$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	3216	7200	No
$v_{12} = v_F - v_R$	3004	7200	No
$v_{12} = v_R$	212	2000	No
$v_{12} \text{ or } v_{12}$	992 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_{12} > 2700$ pc/h?		No	
Is $v_{12} \text{ or } v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 2224$	(Equation 13-15, 13-16, 13-18, or 13-19)		
$v_{12} = 2224$			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2224	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 12.6$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.447$

S

Space mean speed in ramp influence area, $S = 57.5$ mph

R

Space mean speed in outer lanes, S = 76.8 mph

0

Space mean speed for all vehicles, S = 62.3 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2927	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	185	vph
Length of first accel/decel lane	180	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1105	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2900	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2927	185	1105	vph
Peak-hour factor, PHF	0.91	0.90	0.90	

Peak 15-min volume, v_{15}	804	51	307	v
Trucks and buses	24	29	11	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.873	0.948	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3602	235	1295	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.659$ Using Equation 5

FD

$v_{12} = v_F + (v - v_F) P = 2454$ pc/h

$v_{12} = 2454$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	3602	7200	No
$v_{12} = v_F - v_R$	3367	7200	No
$v_{12} = v_R$	235	2000	No
v_{12} or v_{12}	1148 pc/h	(Equation 13-14 or 13-17)	
Is v_{12} or $v_{12} > 2700$ pc/h?		No	
Is v_{12} or $v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 2454$	(Equation 13-15, 13-16, 13-18, or 13-19)		

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2454	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 23.7$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.449$

S

Space mean speed in ramp influence area, $S = 57.4$ mph

R

Space mean speed in outer lanes, S = 76.2 mph

0

Space mean speed for all vehicles, S = 62.3 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3743	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	404	vph
Length of first accel/decel lane	850	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	193	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	750	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3743	404	193	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v_{15}	1017	112	54	v
Trucks and buses	22	10	11	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.952	0.948	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	4516	471	226	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.625$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 3001$ pc/h

$v_{12} = 3001$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	4516	7200	No
$v_{12} = v_F - v_R$	4045	7200	No
$v_{12} = v_R$	471	2000	No
v_{12} or v_{12}	1515 pc/h	(Equation 13-14 or 13-17)	
v_{12} or v_{12}	> 2700 pc/h?	No	
v_{12} or v_{12}	$> 1.5 v_{12} / 2$	No	
If yes, $v_{12} = 3001$	(Equation 13-15, 13-16, 13-18, or 13-19)		

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3001	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 22.4$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.470$

S

Space mean speed in ramp influence area, $S = 56.8$ mph

R

Space mean speed in outer lanes, S = 74.8 mph

0

Space mean speed for all vehicles, S = 61.8 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3937	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	194	vph
Length of first accel/decel lane	150	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	404	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	920	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3937	194	404	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v_{15}	1070	54	112	v
Trucks and buses	22	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	4750	226	471	pcph

Estimation of V12 Diverge Areas

$$L = 515.27 \text{ (Equation 13-12 or 13-13)}$$

EQ

$$P = 0.631 \text{ Using Equation 5}$$

FD

$$v_{12} = v_F + (v_R - v_F) P = 3080 \text{ pc/h}$$

12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	4750	7200	No
$v_{12} = v_F - v_R$	4524	7200	No
$v_{12} = v_F$	226	2000	No
$v_{12} \text{ or } v_{12}$	1670 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_{12} > 2700 \text{ pc/h?}$		No	
Is $v_{12} \text{ or } v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 3080$	(Equation 13-15, 13-16, 13-18, or 13-19)		
12A			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3080	4400	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L = 29.4 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

$$\text{Intermediate speed variable, } D = 0.448$$

S

$$\text{Space mean speed in ramp influence area, } S = 57.4 \text{ mph}$$

R

Space mean speed in outer lanes, S = 74.2 mph

0

Space mean speed for all vehicles, S = 62.4 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3532	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	743	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane	1500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	125	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3532	743	125	vph
Peak-hour factor, PHF	0.92	0.92	0.92	

Peak 15-min volume, v_{15}	960	202	34	v
Trucks and buses	22	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	4261	848	143	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.450$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 2384$ pc/h

$v_{12} = 2384$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	4261	7200	No
$v_{12} = v_F - v_R$	3413	7200	No
$v_{12} = v_R$	848	4000	No
$v_{12} = v_F$ or $v_{12} = v_R$	1877 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} > 2700$ pc/h?		No	
Is $v_{12} > 1.5 v_{12} / 2$		Yes	
If yes, $v_{12} = 2434$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
$v_{12} = 2434$	2434	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = -15.3$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable, $D = 0.504$

S

Space mean speed in ramp influence area, $S = 55.9$ mph

R

Space mean speed in outer lanes, S = 73.6 mph

0

Space mean speed for all vehicles, S = 62.3 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2647	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	247	vph
Length of first accel/decel lane	650	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	154	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1300	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2647	247	154	vph
Peak-hour factor, PHF	0.92	0.94	0.90	

Peak 15-min volume, v_{15}	719	66	43	v
Trucks and buses	22	25	16	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.889	0.926	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3194	296	185	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.667$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 2228$ pc/h

$v_{12} = 2228$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	3194	7200	No
$v_{12} = v_F - v_R$	2898	7200	No
$v_{12} = v_R$	296	2000	No
$v_{12} \text{ or } v_R$	966 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_R > 2700$ pc/h?		No	
Is $v_{12} \text{ or } v_R > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 2228$	(Equation 13-15, 13-16, 13-18, or 13-19)		
$v_{12} = 2228$			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2228	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 17.6$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.455$

S

Space mean speed in ramp influence area, $S = 57.3$ mph

R

Space mean speed in outer lanes, S = 76.8 mph

0

Space mean speed for all vehicles, S = 62.0 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2914	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	267	vph
Length of first accel/decel lane	250	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	230	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	1775	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2914	267	230	vph
Peak-hour factor, PHF	0.92	0.94	0.94	

Peak 15-min volume, v_{15}	792	71	61	v
Trucks and buses	22	25	25	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.889	0.889	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3516	320	275	pcph

Estimation of V12 Diverge Areas

$$L = 299.23 \text{ (Equation 13-12 or 13-13)}$$

EQ

$$P = 0.657 \text{ Using Equation 5}$$

FD

$$v_{12} = v_F + (v_R - v_F) P = 2421 \text{ pc/h}$$

12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	3516	7200	No
$v_{12} = v_F - v_R$	3196	7200	No
$v_{12} = v_F - v_R$	320	2000	No
$v_{12} \text{ or } v_{12}$	1095 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_{12} > 2700 \text{ pc/h?}$		No	
Is $v_{12} \text{ or } v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 2421$	(Equation 13-15, 13-16, 13-18, or 13-19)		
12A			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2421	4400	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L = 22.8 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

$$\text{Intermediate speed variable, } D = 0.457$$

S

$$\text{Space mean speed in ramp influence area, } S = 57.2 \text{ mph}$$

R

Space mean speed in outer lanes, S = 76.4 mph

0

Space mean speed for all vehicles, S = 62.1 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2567	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	192	vph
Length of first accel/decel lane	475	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	66	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2567	192	66	vph
Peak-hour factor, PHF	0.92	0.90	0.92	

Peak 15-min volume, v ₁₅	698	53	18	v
Trucks and buses	22	46	36	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.901	0.813	0.847	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	3097	262	85	pcph

Estimation of V₁₂ Diverge Areas

L = (Equation 13-12 or 13-13)

EQ

P = 1.000 Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 3097$ pc/h

12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	3097	4800	No
$v_{12} = v_F - v_R$	2835	4800	No
$v_{12} = v_R$	262	2000	No
v_{12} or v_{12}	0 pc/h	(Equation 13-14 or 13-17)	
3 av ₃₄			
Is v_{12} or v_{12} > 2700 pc/h?		No	
3 av ₃₄			
Is v_{12} or v_{12} > 1.5 v ₁₂ / 2		No	
3 av ₃₄ 12			
If yes, v ₁₂ = 3097	(Equation 13-15, 13-16, 13-18, or 13-19)		
12A			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v ₁₂	3097	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 26.6$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.452$

S

Space mean speed in ramp influence area, $S = 57.4$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 57.4 mph

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: West of SC 453
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1991	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	547	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	1225	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.2	mi/h
Free-flow speed, FFS	72.2	mi/h

LOS and Performance Measures

Flow rate, vp	1225	pc/h/ln
Free-flow speed, FFS	72.2	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	2	
Density, D	17.5	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Between SC 453 Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1924	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	529	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	1184	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.33	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.3	mi/h
Free-flow speed, FFS	74.1	mi/h

LOS and Performance Measures

Flow rate, vp	1184	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	74.6	mi/h
Number of lanes, N	2	
Density, D	15.9	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: SC 453 to SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2095	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	576	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	1289	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	1289	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	74.1	mi/h
Number of lanes, N	2	
Density, D	17.4	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Between SC 27 Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1926	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	529	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	790	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	790	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	10.5	pc/mi/ln
Level of service, LOS	A	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Between SC 27 Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1973	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	542	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	809	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	809	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	10.8	pc/mi/ln
Level of service, LOS	A	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Between SC 27 & Volvo
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2613	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	718	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	1072	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	1072	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	74.9	mi/h
Number of lanes, N	3	
Density, D	14.3	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Between Volvo Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2427	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	667	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	996	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	996	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	13.3	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Volvo to Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2927	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	804	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	1201	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1201	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	74.6	mi/h
Number of lanes, N	3	
Density, D	16.1	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2742	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	753	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	1125	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.50	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.8	mi/h
Free-flow speed, FFS	73.6	mi/h

LOS and Performance Measures

Flow rate, vp	1125	pc/h/ln
Free-flow speed, FFS	73.6	mi/h
Average passenger-car speed, S	74.8	mi/h
Number of lanes, N	3	
Density, D	15.0	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Jedburg to Nexton
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3847	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	1057	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	1578	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.20	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.8	mi/h
Free-flow speed, FFS	71.6	mi/h

LOS and Performance Measures

Flow rate, vp	1578	pc/h/ln
Free-flow speed, FFS	71.6	mi/h
Average passenger-car speed, S	68.3	mi/h
Number of lanes, N	3	
Density, D	23.1	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Nexton to Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3937	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1070	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1583	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.33	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	4.1	mi/h
Free-flow speed, FFS	71.3	mi/h

LOS and Performance Measures

Flow rate, vp	1583	pc/h/ln
Free-flow speed, FFS	71.3	mi/h
Average passenger-car speed, S	68.3	mi/h
Number of lanes, N	3	
Density, D	23.2	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3339	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	907	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1343	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1343	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	73.7	mi/h
Number of lanes, N	3	
Density, D	18.2	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3743	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1017	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1505	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1505	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	72.2	mi/h
Number of lanes, N	3	
Density, D	20.9	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Jeddburg to Volvo
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3532	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	960	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1420	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	1420	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	73.0	mi/h
Number of lanes, N	3	
Density, D	19.4	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between Volvo Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2789	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	758	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1122	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	1122	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	74.8	mi/h
Number of lanes, N	3	
Density, D	15.0	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between Volvo & SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2914	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	792	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1172	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	1172	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	74.7	mi/h
Number of lanes, N	3	
Density, D	15.7	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between SC 27 Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2400	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	652	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	965	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, v_p	965	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	12.9	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between SC 27 Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2647	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	719	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1065	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	1065	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	14.2	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: SC 27 to SC 453
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2567	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	698	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1549	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	1549	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	71.7	mi/h
Number of lanes, N	2	
Density, D	21.6	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between SC 453 Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2375	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	645	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1433	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.33	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.3	mi/h
Free-flow speed, FFS	74.1	mi/h

LOS and Performance Measures

Flow rate, vp	1433	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	72.9	mi/h
Number of lanes, N	2	
Density, D	19.7	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: West of SC 453
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2441	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	663	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1473	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.2	mi/h
Free-flow speed, FFS	72.2	mi/h

LOS and Performance Measures

Flow rate, vp	1473	pc/h/ln
Free-flow speed, FFS	72.2	mi/h
Average passenger-car speed, S	69.1	mi/h
Number of lanes, N	2	
Density, D	21.3	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1924	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	171	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	67	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1924	171	67	vph
Peak-hour factor, PHF	0.91	0.90	0.95	

Peak 15-min volume, v_{15}	529	48	18	v
Trucks and buses	24	36	53	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.847	0.791	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2368	224	89	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)

EQ

$P = 1.000$ Using Equation 0

FM

$v_{12} = v_{12} (P) = 2368$ pc/h

FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	2592	4800	No
FO			
v_{12} or v_{12}	0 pc/h	(Equation 13-14 or 13-17)	
$\frac{v_{12}}{3}$ av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
$\frac{v_{12}}{3}$ av34			
Is v_{12} or v_{12}	$> 1.5 \frac{v_{12}}{12}$	No	
$\frac{v_{12}}{3}$ av34			
If yes, v_{12}	$= 2368$	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2592	4600	No
R12			

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 \frac{v_{12}}{R} + 0.0078 \frac{v_{12}}{A} - 0.00627 L = 20.6$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $M = 0.317$

S

Space mean speed in ramp influence area, $S = 61.1$ mph

R

Space mean speed in outer lanes, $S = N/A$ mph

0

Space mean speed for all vehicles, $S = 61.1$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1926	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	687	vph
Length of first accel/decel lane	900	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	47	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1450	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
	Ramp			
Volume, V (vph)	1926	687	47	vph
Peak-hour factor, PHF	0.91	0.90	0.90	

Peak 15-min volume, v_{15}	529	191	13	v
Trucks and buses	24	16	23	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.926	0.897	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2370	824	58	pcph

Estimation of V12 Merge Areas

$$L = 511.32 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.603 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 1428 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	3194	7200	No
FO			
v_{12} or v_{12}	942 pc/h	(Equation 13-14 or 13-17)	
$\frac{v_{12}}{3}$ av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
$\frac{v_{12}}{3}$ av34			
Is v_{12} or v_{12}	> 1.5 $v_{12} / 2$	Yes	
$\frac{v_{12}}{3}$ av34	12		
If yes, v_{12}	= 1428	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2252	4600	No
12A			

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 17.0 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

$$\text{Intermediate speed variable, } M = 0.295$$

S

$$\text{Space mean speed in ramp influence area, } S_R = 61.7 \text{ mph}$$

R

$$\text{Space mean speed in outer lanes, } S_O = 68.4 \text{ mph}$$

0

$$\text{Space mean speed for all vehicles, } S_A = 63.6 \text{ mph}$$

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2427	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-flow speed on ramp	35.0	mph
Volume on ramp	500	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane	1500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	186	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	3500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2427	500	186	vph
Peak-hour factor, PHF	0.91	0.92	0.92	

Peak 15-min volume, v_{15}	667	136	51	v
Trucks and buses	24	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2987	571	212	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)

EQ

$P = 0.555$ Using Equation 0

FM

$v_{12} = v_{12} (P) = 1658$ pc/h

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	3558	7200	No
FO			
v_{12} or v_{12}	1329 pc/h	(Equation 13-14 or 13-17)	
3 av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
3 av34			
Is v_{12} or v_{12}	> 1.5 $v_{12} / 2$	Yes	
3 av34	12		
If yes, v_{12}	= 1706	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2277	4600	No
12A			

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = -5.2$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable, $M = 0.044$

S

Space mean speed in ramp influence area, $S = 68.8$ mph

R

Space mean speed in outer lanes, $S = 67.2$ mph

0

Space mean speed for all vehicles, $S = 68.2$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2742	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	1105	vph
Length of first accel/decel lane	1120	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	185	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1900	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2742	1105	185	vph
Peak-hour factor, PHF	0.91	0.90	0.90	

Peak 15-min volume, v_{15}	753	307	51	v
Trucks and buses	24	11	29	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.948	0.873	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3375	1295	235	pcph

Estimation of V12 Merge Areas

$$L = 924.86 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.609 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 2055 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	4670	7200	No
FO			
v_{12} or v_{12}	1320 pc/h	(Equation 13-14 or 13-17)	
v_{12} or v_{12}			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
v_{12} or v_{12}			
Is v_{12} or v_{12}	> 1.5 v_{12} / 2	Yes	
v_{12} or v_{12}			
If yes, v_{12}	= 2055	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3350	4600	No
12A			

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 24.0 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $M = 0.354$

S

Space mean speed in ramp influence area, $S = 60.1$ mph

R

Space mean speed in outer lanes, $S = 67.0$ mph

0

Space mean speed for all vehicles, $S = 61.9$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3339	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	193	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	404	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	750	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3339	193	404	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v ₁₅	907	54	112	v
Trucks and buses	22	11	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.901	0.948	0.952	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	4029	226	471	pcph

Estimation of V₁₂ Merge Areas

$$L = 1004.77 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.603 \text{ Using Equation 2}$$

FM

$$v_{12} = v_{12} (P) = 2431 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v ₁₂	4255	7200	No
FO			
v ₁₂ or v ₃₄	1598 pc/h	(Equation 13-14 or 13-17)	
Is v ₁₂ or v ₃₄ > 2700 pc/h?		No	
Is v ₁₂ or v ₃₄ > 1.5 v ₁₂ / 2		Yes	
If yes, v _{12A} = 2431		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v _{12A}	2657	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_A - 0.00627 L = 16.7 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

$$\text{Intermediate speed variable, } M = 0.272$$

S

$$\text{Space mean speed in ramp influence area, } S_R = 62.4 \text{ mph}$$

R

$$\text{Space mean speed in outer lanes, } S_O = 66.0 \text{ mph}$$

O

$$\text{Space mean speed for all vehicles, } S = 63.7 \text{ mph}$$

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2789	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	125	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	743	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2789	125	743	vph
Peak-hour factor, PHF	0.92	0.92	0.92	

Peak 15-min volume, v_{15}	758	34	202	v
Trucks and buses	22	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3365	143	848	pcph

Estimation of V12 Merge Areas

$$L = 844.91 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.619 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 2085 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	3508	7200	No
FO			
v_{12} or v_{12}	1280 pc/h	(Equation 13-14 or 13-17)	
3 av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
3 av34			
Is v_{12} or v_{12}	> 1.5 $v_{12} / 2$	Yes	
3 av34	12		
If yes, v_{12}	= 2085	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2228	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 13.4 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.252$

S

Space mean speed in ramp influence area, $S = 62.9 \text{ mph}$

R

Space mean speed in outer lanes, $S = 67.2 \text{ mph}$

0

Space mean speed for all vehicles, $S = 64.4 \text{ mph}$

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2400	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	167	vph
Length of first accel/decel lane	900	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	230	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1300	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2400	167	230	vph
Peak-hour factor, PHF	0.92	0.90	0.94	

Peak 15-min volume, v_{15}	652	46	61	v
Trucks and buses	22	16	25	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.926	0.889	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2896	200	275	pcph

Estimation of V12 Merge Areas

$$L = 490.34 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.603 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 1745 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	3096	7200	No
FO			
v_{12} or v_{12}	1151 pc/h	(Equation 13-14 or 13-17)	
v_{12} or v_{12}			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
v_{12} or v_{12}			
Is v_{12} or v_{12}	> 1.5 v_{12} / 2	Yes	
v_{12} or v_{12}			
If yes, v_{12}	= 1745	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1945	4600	No
12A			

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 14.9 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.285$

S

Space mean speed in ramp influence area, $S = 62.0$ mph

R

Space mean speed in outer lanes, $S = 67.7$ mph

0

Space mean speed for all vehicles, $S = 64.0$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2375	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	66	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	192	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2375	66	192	vph
Peak-hour factor, PHF	0.92	0.92	0.90	

Peak 15-min volume, v ₁₅	645	18	53	v
Trucks and buses	22	36	46	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.901	0.847	0.813	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	2865	85	262	pcph

Estimation of V₁₂ Merge Areas

L = (Equation 13-6 or 13-7)

EQ

P = 1.000 Using Equation 0

FM

v = v₁₂ (P) = 2865 pc/h

FM

Capacity Checks

	Actual	Maximum	LOS F?
v	2950	4800	No
FO			
v or v ₃	0 pc/h	(Equation 13-14 or 13-17)	
av ₃₄			
Is v or v ₃	> 2700 pc/h?	No	
av ₃₄			
Is v or v ₃	> 1.5 v ₁₂ / 2	No	
av ₃₄			
If yes, v _{12A}	= 2865	(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v	2950	4600	No
R ₁₂			

Level of Service Determination (if not F)

Density, D = $5.475 + 0.00734 v_R + 0.0078 v_A - 0.00627 L$ = 23.4 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, M = 0.340

S

Space mean speed in ramp influence area, S = 60.5 mph

R

Space mean speed in outer lanes, S = N/A mph

0

Space mean speed for all vehicles, S = 60.5 mph

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Jedburg Road (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.93
Shoulder width	2.5 ft	% Trucks and buses	11 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 451 veh/h
Opposing direction volume, Vo 719 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.2	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.978	0.989
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	496 pc/h	782 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	1.3	mi/h
Average travel speed, ATSD	32.3	mi/h
Percent Free Flow Speed, PFFS	74.3	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	485 pc/h	773 pc/h
Base percent time-spent-following,(note-4) BPTSFd	53.5	%
Adjustment for no-passing zones, fnp	29.9	
Percent time-spent-following, PTSFd	65.0	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.29
Peak 15-min vehicle-miles of travel, VMT15	121 veh-mi
Peak-hour vehicle-miles of travel, VMT60	451 veh-mi
Peak 15-min total travel time, TT15	3.7 veh-h
Capacity from ATS, CdATS	1681 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1681 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.3	mi/h
Percent time-spent-following, PTSFd (from above)	65.0	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 484.9
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 7.39
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Jedburg Road (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.94
Shoulder width	2.5 ft	% Trucks and buses	11 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	60 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 994 veh/h
Opposing direction volume, Vo 683 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	1.000	0.989
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	1057 pc/h	735 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	1.0	mi/h
Average travel speed, ATSD	28.6	mi/h
Percent Free Flow Speed, PFFS	65.8	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	1057 pc/h	727 pc/h
Base percent time-spent-following,(note-4) BPTSFd	77.5	%
Adjustment for no-passing zones, fnp	19.5	
Percent time-spent-following, PTSFd	89.1	%

Level of Service and Other Performance Measures

Level of service, LOS	E
Volume to capacity ratio, v/c	0.62
Peak 15-min vehicle-miles of travel, VMT15	264 veh-mi
Peak-hour vehicle-miles of travel, VMT60	994 veh-mi
Peak 15-min total travel time, TT15	9.2 veh-h
Capacity from ATS, CdATS	1681 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1681 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	28.6	mi/h
Percent time-spent-following, PTSFd (from above)	89.1	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 1057.4
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 7.79
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Volvo Car Drive (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	6.0 ft	% Trucks and buses	10 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	20 %
Up/down	- %	Access point density	8 /mi

Analysis direction volume, Vd 928 veh/h
Opposing direction volume, Vo 625 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	1.000	0.990
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	1009 pc/h	686 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 0.0 mi/h
Adj. for access point density,(note-3) fA 2.0 mi/h

Free-flow speed, FFSd	48.0	mi/h
Adjustment for no-passing zones, fnp	0.5	mi/h
Average travel speed, ATSD	34.4	mi/h
Percent Free Flow Speed, PFFS	71.7	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	1009 pc/h	679 pc/h
Base percent time-spent-following,(note-4) BPTSFd	75.5	%
Adjustment for no-passing zones, fnp	16.3	
Percent time-spent-following, PTSFd	85.2	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.59
Peak 15-min vehicle-miles of travel, VMT15	252 veh-mi
Peak-hour vehicle-miles of travel, VMT60	928 veh-mi
Peak 15-min total travel time, TT15	7.3 veh-h
Capacity from ATS, CdATS	1683 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1683 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	34.4	mi/h
Percent time-spent-following, PTSFd (from above)	85.2	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 1008.7
Effective width of outside lane, We 24.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.45
Bicycle LOS E

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 27 (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.93
Shoulder width	1.0 ft	% Trucks and buses	16 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	30 /mi

Analysis direction volume, Vd 549 veh/h
Opposing direction volume, Vo 500 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.2
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.984	0.969
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	600 pc/h	555 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 7.5 mi/h

Free-flow speed, FFSd	43.3	mi/h
Adjustment for no-passing zones, fnp	2.0	mi/h
Average travel speed, ATSD	32.3	mi/h
Percent Free Flow Speed, PFFS	74.7	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	590 pc/h	538 pc/h
Base percent time-spent-following,(note-4) BPTSFd	57.5	%
Adjustment for no-passing zones, fnp	36.0	
Percent time-spent-following, PTSFd	76.3	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.35
Peak 15-min vehicle-miles of travel, VMT15	148 veh-mi
Peak-hour vehicle-miles of travel, VMT60	549 veh-mi
Peak 15-min total travel time, TT15	4.6 veh-h
Capacity from ATS, CdATS	1647 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1647 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.3	mi/h
Percent time-spent-following, PTSFd (from above)	76.3	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 590.3
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 10.01
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 27 (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.91
Shoulder width	2.5 ft	% Trucks and buses	16 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	10 /mi

Analysis direction volume, Vd 695 veh/h
Opposing direction volume, Vo 480 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.2
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.984	0.969
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	776 pc/h	544 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 2.5 mi/h

Free-flow speed, FFSd	49.5	mi/h
Adjustment for no-passing zones, fnp	2.1	mi/h
Average travel speed, ATSD	37.1	mi/h
Percent Free Flow Speed, PFFS	75.0	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	764 pc/h	527 pc/h
Base percent time-spent-following,(note-4) BPTSFd	65.4	%
Adjustment for no-passing zones, fnp	30.0	
Percent time-spent-following, PTSFd	83.2	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.46
Peak 15-min vehicle-miles of travel, VMT15	191 veh-mi
Peak-hour vehicle-miles of travel, VMT60	695 veh-mi
Peak 15-min total travel time, TT15	5.1 veh-h
Capacity from ATS, CdATS	1647 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1647 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	37.1	mi/h
Percent time-spent-following, PTSFd (from above)	83.2	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 763.7
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 10.01
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 453 (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	1.0 ft	% Trucks and buses	36 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	75 %
Up/down	- %	Access point density	4 /mi

Analysis direction volume, Vd 234 veh/h
Opposing direction volume, Vo 151 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.4	1.6
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.874	0.822
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	291 pc/h	200 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.7 mi/h
Adj. for access point density,(note-3) fA 1.0 mi/h

Free-flow speed, FFSd	39.3	mi/h
Adjustment for no-passing zones, fnp	3.6	mi/h
Average travel speed, ATSD	31.9	mi/h
Percent Free Flow Speed, PFFS	81.1	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.965	0.965
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	264 pc/h	170 pc/h
Base percent time-spent-following,(note-4) BPTSFd	27.2	%
Adjustment for no-passing zones, fnp	53.7	
Percent time-spent-following, PTSFd	59.9	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.17
Peak 15-min vehicle-miles of travel, VMT15	64 veh-mi
Peak-hour vehicle-miles of travel, VMT60	234 veh-mi
Peak 15-min total travel time, TT15	2.0 veh-h
Capacity from ATS, CdATS	1397 veh/h
Capacity from PTSF, CdPTSF	1641 veh/h
Directional Capacity	1397 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	31.9	mi/h
Percent time-spent-following, PTSFd (from above)	59.9	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 254.3
Effective width of outside lane, We 12.50
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 24.36
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
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Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 453 (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	36 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	70 %
Up/down	- %	Access point density	16 /mi

Analysis direction volume, Vd 227 veh/h
Opposing direction volume, Vo 190 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.4	1.5
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.874	0.847
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	289 pc/h	249 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 4.0 mi/h

Free-flow speed, FFSd	36.8	mi/h
Adjustment for no-passing zones, fnp	3.2	mi/h
Average travel speed, ATSD	29.5	mi/h
Percent Free Flow Speed, PFFS	80.1	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.965	0.965
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	261 pc/h	219 pc/h
Base percent time-spent-following,(note-4) BPTSFd	27.9	%
Adjustment for no-passing zones, fnp	56.6	
Percent time-spent-following, PTSFd	58.7	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.17
Peak 15-min vehicle-miles of travel, VMT15	63 veh-mi
Peak-hour vehicle-miles of travel, VMT60	227 veh-mi
Peak 15-min total travel time, TT15	2.1 veh-h
Capacity from ATS, CdATS	1440 veh/h
Capacity from PTSF, CdPTSF	1641 veh/h
Directional Capacity	1440 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	29.5	mi/h
Percent time-spent-following, PTSFd (from above)	58.7	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 252.2
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 24.29
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Jedburg Road (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.93
Shoulder width	2.5 ft	% Trucks and buses	11 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 719 veh/h
Opposing direction volume, Vo 451 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.2
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.989	0.978
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	782 pc/h	496 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	2.3	mi/h
Average travel speed, ATSD	31.3	mi/h
Percent Free Flow Speed, PFFS	72.0	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	773 pc/h	485 pc/h
Base percent time-spent-following,(note-4) BPTSFd	65.8	%
Adjustment for no-passing zones, fnp	29.9	
Percent time-spent-following, PTSFd	84.2	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.46
Peak 15-min vehicle-miles of travel, VMT15	193 veh-mi
Peak-hour vehicle-miles of travel, VMT60	719 veh-mi
Peak 15-min total travel time, TT15	6.2 veh-h
Capacity from ATS, CdATS	1663 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1663 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	31.3	mi/h
Percent time-spent-following, PTSFd (from above)	84.2	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 773.1
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 7.63
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Jedburg Road (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.94
Shoulder width	2.5 ft	% Trucks and buses	11 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	60 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 683 veh/h
Opposing direction volume, Vo 994 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.989	1.000
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	735 pc/h	1057 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	0.6	mi/h
Average travel speed, ATSD	29.0	mi/h
Percent Free Flow Speed, PFFS	66.7	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	727 pc/h	1057 pc/h
Base percent time-spent-following,(note-4) BPTSFd	69.0	%
Adjustment for no-passing zones, fnp	19.5	
Percent time-spent-following, PTSFd	76.9	%

Level of Service and Other Performance Measures

Level of service, LOS	E
Volume to capacity ratio, v/c	0.43
Peak 15-min vehicle-miles of travel, VMT15	182 veh-mi
Peak-hour vehicle-miles of travel, VMT60	683 veh-mi
Peak 15-min total travel time, TT15	6.3 veh-h
Capacity from ATS, CdATS	1700 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1700 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	29.0	mi/h
Percent time-spent-following, PTSFd (from above)	76.9	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 726.6
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 7.60
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Volvo Car Drive (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	6.0 ft	% Trucks and buses	10 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	20 %
Up/down	- %	Access point density	8 /mi

Analysis direction volume, Vd 625 veh/h
Opposing direction volume, Vo 928 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.990	1.000
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	686 pc/h	1009 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 0.0 mi/h
Adj. for access point density,(note-3) fA 2.0 mi/h

Free-flow speed, FFSd	48.0	mi/h
Adjustment for no-passing zones, fnp	0.4	mi/h
Average travel speed, ATSD	34.5	mi/h
Percent Free Flow Speed, PFFS	71.8	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	679 pc/h	1009 pc/h
Base percent time-spent-following,(note-4) BPTSFd	66.4	%
Adjustment for no-passing zones, fnp	16.3	
Percent time-spent-following, PTSFd	73.0	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.40
Peak 15-min vehicle-miles of travel, VMT15	170 veh-mi
Peak-hour vehicle-miles of travel, VMT60	625 veh-mi
Peak 15-min total travel time, TT15	4.9 veh-h
Capacity from ATS, CdATS	1700 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1700 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	34.5	mi/h
Percent time-spent-following, PTSFd (from above)	73.0	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 679.3
Effective width of outside lane, We 24.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.25
Bicycle LOS E

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 27 (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.93
Shoulder width	1.0 ft	% Trucks and buses	16 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	30 /mi

Analysis direction volume, Vd 500 veh/h
Opposing direction volume, Vo 549 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.2	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.969	0.984
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	555 pc/h	600 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 7.5 mi/h

Free-flow speed, FFSd	43.3	mi/h
Adjustment for no-passing zones, fnp	1.8	mi/h
Average travel speed, ATSD	32.5	mi/h
Percent Free Flow Speed, PFFS	75.1	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	538 pc/h	590 pc/h
Base percent time-spent-following,(note-4) BPTSFd	53.9	%
Adjustment for no-passing zones, fnp	36.0	
Percent time-spent-following, PTSFd	71.1	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.33
Peak 15-min vehicle-miles of travel, VMT15	134 veh-mi
Peak-hour vehicle-miles of travel, VMT60	500 veh-mi
Peak 15-min total travel time, TT15	4.1 veh-h
Capacity from ATS, CdATS	1673 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1673 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.5	mi/h
Percent time-spent-following, PTSFd (from above)	71.1	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 537.6
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 9.97
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 27 (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.91
Shoulder width	2.5 ft	% Trucks and buses	16 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	10 /mi

Analysis direction volume, Vd 480 veh/h
Opposing direction volume, Vo 695 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.2	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.969	0.984
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	544 pc/h	776 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 2.5 mi/h

Free-flow speed, FFSd	49.5	mi/h
Adjustment for no-passing zones, fnp	1.4	mi/h
Average travel speed, ATSD	37.9	mi/h
Percent Free Flow Speed, PFFS	76.6	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	527 pc/h	764 pc/h
Base percent time-spent-following,(note-4) BPTSFd	56.5	%
Adjustment for no-passing zones, fnp	30.0	
Percent time-spent-following, PTSFd	68.7	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.32
Peak 15-min vehicle-miles of travel, VMT15	132 veh-mi
Peak-hour vehicle-miles of travel, VMT60	480 veh-mi
Peak 15-min total travel time, TT15	3.5 veh-h
Capacity from ATS, CdATS	1673 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1673 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	37.9	mi/h
Percent time-spent-following, PTSFd (from above)	68.7	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 527.5
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 9.82
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 453 (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	1.0 ft	% Trucks and buses	36 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	75 %
Up/down	- %	Access point density	4 /mi

Analysis direction volume, Vd 151 veh/h
Opposing direction volume, Vo 234 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.6	1.4
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.822	0.874
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	200 pc/h	291 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.7 mi/h
Adj. for access point density,(note-3) fA 1.0 mi/h

Free-flow speed, FFSd	39.3	mi/h
Adjustment for no-passing zones, fnp	3.1	mi/h
Average travel speed, ATSD	32.4	mi/h
Percent Free Flow Speed, PFFS	82.5	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.965	0.965
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	170 pc/h	264 pc/h
Base percent time-spent-following,(note-4) BPTSFd	20.7	%
Adjustment for no-passing zones, fnp	53.7	
Percent time-spent-following, PTSFd	41.7	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.12
Peak 15-min vehicle-miles of travel, VMT15	41 veh-mi
Peak-hour vehicle-miles of travel, VMT60	151 veh-mi
Peak 15-min total travel time, TT15	1.3 veh-h
Capacity from ATS, CdATS	1486 veh/h
Capacity from PTSF, CdPTSF	1641 veh/h
Directional Capacity	1486 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.4	mi/h
Percent time-spent-following, PTSFd (from above)	41.7	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 164.1
Effective width of outside lane, We 15.56
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 23.71
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 453 (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	36 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	70 %
Up/down	- %	Access point density	16 /mi

Analysis direction volume, Vd 190 veh/h
Opposing direction volume, Vo 227 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.5	1.4
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.847	0.874
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	249 pc/h	289 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 4.0 mi/h

Free-flow speed, FFSd	36.8	mi/h
Adjustment for no-passing zones, fnp	2.9	mi/h
Average travel speed, ATSD	29.7	mi/h
Percent Free Flow Speed, PFFS	80.7	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.965	0.965
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	219 pc/h	261 pc/h
Base percent time-spent-following,(note-4) BPTSFd	24.4	%
Adjustment for no-passing zones, fnp	56.6	
Percent time-spent-following, PTSFd	50.2	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.15
Peak 15-min vehicle-miles of travel, VMT15	53 veh-mi
Peak-hour vehicle-miles of travel, VMT60	190 veh-mi
Peak 15-min total travel time, TT15	1.8 veh-h
Capacity from ATS, CdATS	1486 veh/h
Capacity from PTSF, CdPTSF	1641 veh/h
Directional Capacity	1486 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	29.7	mi/h
Percent time-spent-following, PTSFd (from above)	50.2	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 211.1
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 24.20
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2617	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	37	vph
Length of first accel/decel lane	465	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	194	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2617	37	194	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v_{15}	711	10	54	v
Trucks and buses	10	52	24	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.794	0.893	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2987	52	241	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 2987$ pc/h

$v_{12} = 2987$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	2987	4800	No
$v_{12} = v_F$			
$v_{12} = v_F - v_R$	2935	4800	No
$v_{12} = v_F - v_R$			
$v_{12} = v_F$	52	2000	No
$v_{12} = v_F$			
$v_{12} = v_F$ or $v_{12} = v_R$	0 pc/h	(Equation 13-14 or 13-17)	
$v_{12} = v_F$ or $v_{12} = v_R$			
Is $v_{12} = v_F$ or $v_{12} = v_R$ > 2700 pc/h?		No	
Is $v_{12} = v_F$ or $v_{12} = v_R$ > 1.5 $v_{12} / 2$		No	
If yes, $v_{12} = 2987$		(Equation 13-15, 13-16, 13-18, or 13-19)	
$v_{12} = 2987$			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2987	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 25.8$ pc/mi/ln

$D = 25.8$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.433$

S

Space mean speed in ramp influence area, $S = 57.9$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 57.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2613	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	30	vph
Length of first accel/decel lane	650	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	686	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1450	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2613	30	686	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v ₁₅	710	8	191	v
Trucks and buses	10	8	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.952	0.962	0.966	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	2982	35	789	pcph

Estimation of V₁₂ Diverge Areas

L = (Equation 13-12 or 13-13)

EQ

P = 0.684 Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 2050$ pc/h

12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
v = v Fi F	2982	7200	No
v = v - v FO F R	2947	7200	No
v R	35	2000	No
v or v 3 av34	932 pc/h	(Equation 13-14 or 13-17)	
Is v or v 3 av34	> 2700 pc/h?	No	
Is v or v 3 av34	> 1.5 v /2	No	
	12		
If yes, v = 2050 12A	(Equation 13-15, 13-16, 13-18, or 13-19)		

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2050	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 16.0$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.431$

S

Space mean speed in ramp influence area, $S = 57.9$ mph

R

Space mean speed in outer lanes, S = 76.8 mph

0

Space mean speed for all vehicles, S = 62.7 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2774	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	161	vph
Length of first accel/decel lane	250	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	30	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	1600	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2774	161	30	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v_{15}	754	45	8	v
Trucks and buses	10	15	8	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.930	0.962	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3166	192	35	pcph

Estimation of V12 Diverge Areas

$$L = 35.81 \text{ (Equation 13-12 or 13-13)}$$

EQ

$$P = 0.672 \text{ Using Equation 5}$$

FD

$$v_{12} = v_F + (v_R - v_F) P = 2191 \text{ pc/h}$$

12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	3166	7200	No
$v_{12} = v_F - v_R$	2974	7200	No
$v_{12} = v_R$	192	2000	No
$v_{12} \text{ or } v_{12}$	975 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_{12} > 2700 \text{ pc/h?}$		No	
Is $v_{12} \text{ or } v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 2191$	(Equation 13-15, 13-16, 13-18, or 13-19)		
12A			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2191	4400	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L = 20.8 \text{ pc/mi/ln}$$

R 12 D

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

$$\text{Intermediate speed variable, } D = 0.445$$

S

$$\text{Space mean speed in ramp influence area, } S = 57.5 \text{ mph}$$

R

Space mean speed in outer lanes, S = 76.8 mph

0

Space mean speed for all vehicles, S = 62.3 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3286	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	86	vph
Length of first accel/decel lane	1200	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	623	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	3500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3286	86	623	vph
Peak-hour factor, PHF	0.92	0.92	0.92	

Peak 15-min volume, v_{15}	893	23	169	v
Trucks and buses	10	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3750	98	711	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.662$ Using Equation 5

FD

$v_{12} = v_R + (v_F - v_R) P = 2515$ pc/h

v_{12} R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_R$	3750	7200	No
$v_{12} = v_F$			
$v_{12} = v_F - v_R$	3652	7200	No
$v_{12} = v_F - v_R$			
$v_{12} = v_F$	98	2000	No
$v_{12} = v_F$			
$v_{12} = v_F$	1235 pc/h	(Equation 13-14 or 13-17)	
$v_{12} = v_F$			
Is $v_{12} = v_F > 2700$ pc/h?		No	
$v_{12} = v_F$			
Is $v_{12} = v_F > 1.5 v_{12} / 2$		No	
$v_{12} = v_F$			
If yes, $v_{12} = 2515$		(Equation 13-15, 13-16, 13-18, or 13-19)	
$v_{12} = v_F$			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2515	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 15.1$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.437$

S

Space mean speed in ramp influence area, $S = 57.8$ mph

R

Space mean speed in outer lanes, S = 75.9 mph

0

Space mean speed for all vehicles, S = 62.7 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3823	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	202	vph
Length of first accel/decel lane	180	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	824	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2900	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3823	202	824	vph
Peak-hour factor, PHF	0.92	0.91	0.90	

Peak 15-min volume, v_{15}	1039	55	229	v
Trucks and buses	10	19	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.913	0.966	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	4363	243	948	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.640$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 2879$ pc/h

$v_{12} = 2879$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	4363	7200	No
$v_{12} = v_F - v_R$	4120	7200	No
$v_{12} = v_R$	243	2000	No
v_{12} or v_{12}	1484 pc/h	(Equation 13-14 or 13-17)	
Is v_{12} or $v_{12} > 2700$ pc/h?		No	
Is v_{12} or $v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 2879$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2879	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 27.4$ pc/mi/ln

$D = 27.4$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.450$

S

Space mean speed in ramp influence area, $S = 57.4$ mph

R

Space mean speed in outer lanes, S = 74.9 mph

0

Space mean speed for all vehicles, S = 62.4 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	4832	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	802	vph
Length of first accel/decel lane	850	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	198	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	750	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	4832	802	198	vph
Peak-hour factor, PHF	0.93	0.95	0.90	

Peak 15-min volume, v_{15}	1299	211	55	v
Trucks and buses	15	6	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.971	0.966	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	5585	870	228	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.580$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 3606$ pc/h

$v_{12} = 3606$

Capacity Checks

	Actual	Maximum	LOS F?
v = v Fi F	5585	7200	No
v = v - v FO F R	4715	7200	No
v R	870	2000	No
v or v 3 av34	1979 pc/h	(Equation 13-14 or 13-17)	
Is v or v 3 av34 > 2700 pc/h?		No	
Is v or v 3 av34 > 1.5 v /2		No	
If yes, v = 3606 12A		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3606	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 27.6$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.506$

S

Space mean speed in ramp influence area, $S = 55.8$ mph

R

Space mean speed in outer lanes, S = 73.0 mph

0

Space mean speed for all vehicles, S = 60.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	5187	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	355	vph
Length of first accel/decel lane	150	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	802	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	920	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	5187	355	802	vph
Peak-hour factor, PHF	0.93	0.95	0.95	

Peak 15-min volume, v_{15}	1394	93	211	v
Trucks and buses	15	6	6	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	5996	385	870	pcph

Estimation of V12 Diverge Areas

$$L = 1066.96 \text{ (Equation 13-12 or 13-13)}$$

EQ

$$P = 0.607 \text{ Using Equation 7}$$

FD

$$v_{12} = v_F + (v_R - v_F) P = 3793 \text{ pc/h}$$

12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	5996	7200	No
$v_{12} = v_F - v_R$	5611	7200	No
$v_{12} = v_F$	385	2000	No
$v_{12} \text{ or } v_{12}$	2203 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_{12} > 2700 \text{ pc/h?}$		No	
Is $v_{12} \text{ or } v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 3793$	(Equation 13-15, 13-16, 13-18, or 13-19)		
12A			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3793	4400	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L = 35.5 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence E

Speed Estimation

$$\text{Intermediate speed variable, } D = 0.463$$

S

$$\text{Space mean speed in ramp influence area, } S = 57.0 \text{ mph}$$

R

Space mean speed in outer lanes, S = 72.1 mph

0

Space mean speed for all vehicles, S = 61.8 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	4228	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	347	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane	1500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	156	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	4228	347	156	vph
Peak-hour factor, PHF	0.93	0.92	0.92	

Peak 15-min volume, v_{15}	1137	94	42	v
Trucks and buses	15	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	4887	396	178	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.450$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 2417$ pc/h

$12 \quad R \quad F \quad R \quad FD$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	4887	7200	No
$F_i \quad F$			
$v_{12} = v_F - v_R$	4491	7200	No
$FO \quad F \quad R$			
v_R	396	4000	No
R			
v_{12} or v_{12}	2470 pc/h	(Equation 13-14 or 13-17)	
$3 \quad av_{34}$			
Is v_{12} or $v_{12} > 2700$ pc/h?		No	
$3 \quad av_{34}$			
Is v_{12} or $v_{12} > 1.5 v_{12} / 2$		Yes	
$3 \quad av_{34} \quad 12$			
If yes, $v_{12} = 2792$		(Equation 13-15, 13-16, 13-18, or 13-19)	
$12A$			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2792	4400	No
$12A$			

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = -12.2$ pc/mi/ln

$R \quad 12 \quad D$

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable, $D = 0.464$

S

Space mean speed in ramp influence area, $S = 57.0$ mph

R

Space mean speed in outer lanes, S = 72.5 mph

0

Space mean speed for all vehicles, S = 62.8 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3657	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	309	vph
Length of first accel/decel lane	650	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	205	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1300	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3657	309	205	vph
Peak-hour factor, PHF	0.93	0.91	0.90	

Peak 15-min volume, v_{15}	983	85	57	v
Trucks and buses	15	11	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.948	0.966	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	4227	358	236	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.638$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 2826$ pc/h

$v_{12} = 2826$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	4227	7200	No
$v_{12} = v_F - v_R$	3869	7200	No
$v_{12} = v_R$	358	2000	No
$v_{12} = v_F$ or $v_{12} = v_R$	1401 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} > 2700$ pc/h?		No	
Is $v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 2826$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2826	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 22.7$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.460$

S

Space mean speed in ramp influence area, $S = 57.1$ mph

R

Space mean speed in outer lanes, S = 75.2 mph

0

Space mean speed for all vehicles, S = 62.1 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	4037	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	380	vph
Length of first accel/decel lane	250	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	292	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	1775	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	4037	380	292	vph
Peak-hour factor, PHF	0.93	0.91	0.91	

Peak 15-min volume, v_{15}	1085	104	80	v
Trucks and buses	15	7	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.966	0.966	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	4666	432	332	pcph

Estimation of V12 Diverge Areas

$$L = 394.88 \text{ (Equation 13-12 or 13-13)}$$

EQ

$$P = 0.623 \text{ Using Equation 5}$$

FD

$$v_{12} = v_F + (v_R - v_F) P = 3072 \text{ pc/h}$$

12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	4666	7200	No
$v_{12} = v_F - v_R$	4234	7200	No
$v_{12} = v_F$	432	2000	No
$v_{12} \text{ or } v_{12}$	1594 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_{12} > 2700 \text{ pc/h?}$		No	
Is $v_{12} \text{ or } v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 3072$	(Equation 13-15, 13-16, 13-18, or 13-19)		
12A			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3072	4400	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L = 28.4 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

$$\text{Intermediate speed variable, } D = 0.467$$

S

$$\text{Space mean speed in ramp influence area, } S = 56.9 \text{ mph}$$

R

Space mean speed in outer lanes, S = 74.5 mph

0

Space mean speed for all vehicles, S = 61.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3566	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	198	vph
Length of first accel/decel lane	475	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	69	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3566	198	69	vph
Peak-hour factor, PHF	0.93	0.90	0.90	

Peak 15-min volume, v_{15}	959	55	19	v
Trucks and buses	15	21	24	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.905	0.893	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	4122	243	86	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 4122$ pc/h

$v_{12} = 4122$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	4122	4800	No
$v_{12} = v_F - v_R$	3879	4800	No
$v_{12} = v_R$	243	2000	No
v_{12} or v_{12}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_{12} or $v_{12} > 2700$ pc/h?		No	
Is v_{12} or $v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 4122$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	4122	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 35.4$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence E

Speed Estimation

Intermediate speed variable, $D = 0.450$

S

Space mean speed in ramp influence area, $S = 57.4$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 57.4 mph

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: West of SC 453
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2617	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	711	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1493	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.2	mi/h
Free-flow speed, FFS	72.2	mi/h

LOS and Performance Measures

Flow rate, vp	1493	pc/h/ln
Free-flow speed, FFS	72.2	mi/h
Average passenger-car speed, S	69.0	mi/h
Number of lanes, N	2	
Density, D	21.6	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Between SC 453 Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2580	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	701	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1472	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.33	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.3	mi/h
Free-flow speed, FFS	74.1	mi/h

LOS and Performance Measures

Flow rate, vp	1472	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	72.5	mi/h
Number of lanes, N	2	
Density, D	20.3	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: SC 453 to SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2774	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	754	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1583	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	1583	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	71.2	mi/h
Number of lanes, N	2	
Density, D	22.2	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
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Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Between SC 27 Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2583	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	702	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	983	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	983	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	13.1	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
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Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Between SC 27 Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2613	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	710	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	994	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	994	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	13.3	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
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Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Between SC 27 & Volvo
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3286	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	893	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1250	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	1250	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	74.3	mi/h
Number of lanes, N	3	
Density, D	16.8	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

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Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Between Volvo Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3200	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	870	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1217	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	1217	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	74.5	mi/h
Number of lanes, N	3	
Density, D	16.3	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Volvo to Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3823	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1039	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1454	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1454	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	72.7	mi/h
Number of lanes, N	3	
Density, D	20.0	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3621	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	984	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1378	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.50	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.8	mi/h
Free-flow speed, FFS	73.6	mi/h

LOS and Performance Measures

Flow rate, vp	1378	pc/h/ln
Free-flow speed, FFS	73.6	mi/h
Average passenger-car speed, S	73.4	mi/h
Number of lanes, N	3	
Density, D	18.8	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

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Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Jedburg to Nexton
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	4445	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1208	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1691	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.20	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.8	mi/h
Free-flow speed, FFS	71.6	mi/h

LOS and Performance Measures

Flow rate, vp	1691	pc/h/ln
Free-flow speed, FFS	71.6	mi/h
Average passenger-car speed, S	67.2	mi/h
Number of lanes, N	3	
Density, D	25.2	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

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Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Nexton to Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	5187	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	1394	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1999	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.33	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	4.1	mi/h
Free-flow speed, FFS	71.3	mi/h

LOS and Performance Measures

Flow rate, vp	1999	pc/h/ln
Free-flow speed, FFS	71.3	mi/h
Average passenger-car speed, S	62.6	mi/h
Number of lanes, N	3	
Density, D	31.9	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

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Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	4030	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	1083	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1553	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1553	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	71.6	mi/h
Number of lanes, N	3	
Density, D	21.7	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

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Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	4832	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	1299	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1862	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1862	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	66.8	mi/h
Number of lanes, N	3	
Density, D	27.9	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
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Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Jedburg to Volvo
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	4228	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	1137	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1629	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	1629	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	70.6	mi/h
Number of lanes, N	3	
Density, D	23.1	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
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Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between Volvo Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3881	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	1043	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1495	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	1495	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	72.3	mi/h
Number of lanes, N	3	
Density, D	20.7	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between Volvo & SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	4037	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	1085	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1555	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	1555	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	71.6	mi/h
Number of lanes, N	3	
Density, D	21.7	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between SC 27 Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3348	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	900	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1290	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	1290	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	74.1	mi/h
Number of lanes, N	3	
Density, D	17.4	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between SC 27 Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3657	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	983	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1409	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	1409	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	73.1	mi/h
Number of lanes, N	3	
Density, D	19.3	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: SC 27 to SC 453
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3566	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	959	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	2061	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	2061	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	62.5	mi/h
Number of lanes, N	2	
Density, D	33.0	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between SC 453 Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3368	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	905	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1947	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.33	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.3	mi/h
Free-flow speed, FFS	74.1	mi/h

LOS and Performance Measures

Flow rate, vp	1947	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	65.1	mi/h
Number of lanes, N	2	
Density, D	29.9	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: West of SC 453
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3437	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	924	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1986	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.2	mi/h
Free-flow speed, FFS	72.2	mi/h

LOS and Performance Measures

Flow rate, vp	1986	pc/h/ln
Free-flow speed, FFS	72.2	mi/h
Average passenger-car speed, S	62.8	mi/h
Number of lanes, N	2	
Density, D	31.6	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2580	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	194	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	37	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2580	194	37	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v_{15}	701	54	10	v
Trucks and buses	10	24	52	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.893	0.794	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2945	241	52	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)

EQ

$P = 1.000$ Using Equation 0

FM

$v_{12} = v_{12} (P) = 2945$ pc/h

FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	3186	4800	No
FO			
v_{12} or v_{12}	0 pc/h	(Equation 13-14 or 13-17)	
$\frac{v_{12}}{3}$ av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
$\frac{v_{12}}{3}$ av34			
Is v_{12} or v_{12}	$> 1.5 \frac{v_{12}}{12}$	No	
$\frac{v_{12}}{3}$ av34			
If yes, $v_{12} = 2945$	(Equation 13-15, 13-16, 13-18, or 13-19)		
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3186	4600	No
R12			

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 \frac{v_{12}}{R} + 0.0078 \frac{v_{12}}{A} - 0.00627 L = 25.2$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $M = 0.359$

S

Space mean speed in ramp influence area, $S = 59.9$ mph

R

Space mean speed in outer lanes, $S = N/A$ mph

0

Space mean speed for all vehicles, $S = 59.9$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2583	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	703	vph
Length of first accel/decel lane	900	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	30	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1450	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2583	703	30	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v_{15}	702	195	8	v
Trucks and buses	10	12	8	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.943	0.962	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2948	828	35	pcph

Estimation of V12 Merge Areas

$$L = 635.86 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.603 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{15} (P) = 1777 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	3776	7200	No
FO			
v_{12} or v_{15}	1171 pc/h	(Equation 13-14 or 13-17)	
$\frac{v_{12}}{3}$ or $\frac{v_{15}}{3}$			
Is v_{12} or $v_{15} > 2700$ pc/h?		No	
$\frac{v_{12}}{3}$ or $\frac{v_{15}}{3}$			
Is v_{12} or $v_{15} > 1.5 \frac{v_{12}}{3}$?		Yes	
$\frac{v_{12}}{3}$ or $\frac{v_{15}}{3}$	12		
If yes, $v_{12} = 1777$		(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2605	4600	No
12A			

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 \frac{v_{12}}{R} + 0.0078 \frac{v_{15}}{R} - 0.00627 L = 19.8 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

$$\text{Intermediate speed variable, } M = 0.311$$

S

$$\text{Space mean speed in ramp influence area, } S_R = 61.3 \text{ mph}$$

R

$$\text{Space mean speed in outer lanes, } S_O = 67.6 \text{ mph}$$

0

$$\text{Space mean speed for all vehicles, } S_A = 63.1 \text{ mph}$$

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3200	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-flow speed on ramp	35.0	mph
Volume on ramp	623	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane	1500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	86	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	3500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3200	623	86	vph
Peak-hour factor, PHF	0.92	0.92	0.92	

Peak 15-min volume, v_{15}	870	169	23	v
Trucks and buses	10	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3652	711	98	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)

EQ

$P = 0.555$ Using Equation 0

FM

$v_{12} = v_{12} (P) = 2027$ pc/h

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	4363	7200	No
FO			
v_{12} or v_{12}	1625 pc/h	(Equation 13-14 or 13-17)	
3 av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
3 av34			
Is v_{12} or v_{12}	> 1.5 $v_{12} / 2$	Yes	
3 av34	12		
If yes, v_{12}	= 2086	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2797	4600	No
12A			

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = -1.3$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable, $M = 0.070$

S

Space mean speed in ramp influence area, $S = 68.0$ mph

R

Space mean speed in outer lanes, $S = 66.2$ mph

0

Space mean speed for all vehicles, $S = 67.4$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3621	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	824	vph
Length of first accel/decel lane	1120	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	202	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2900	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3621	824	202	vph
Peak-hour factor, PHF	0.92	0.90	0.91	

Peak 15-min volume, v_{15}	984	229	55	v
Trucks and buses	10	7	19	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.966	0.913	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	4133	948	243	pcph

Estimation of V12 Merge Areas

$$L = 1012.81 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.609 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 2516 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	5081	7200	No
FO			
v_{12} or v_{12}	1617 pc/h	(Equation 13-14 or 13-17)	
v_{12} or v_{12}			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
v_{12} or v_{12}			
Is v_{12} or v_{12}	> 1.5 v_{12} / 2	Yes	
v_{12} or v_{12}			
If yes, v_{12}	= 2516	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3464	4600	No
12A			

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 25.0 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

$$\text{Intermediate speed variable, } M = 0.367$$

S

$$\text{Space mean speed in ramp influence area, } S = 59.7 \text{ mph}$$

R

$$\text{Space mean speed in outer lanes, } S = 66.0 \text{ mph}$$

0

$$\text{Space mean speed for all vehicles, } S = 61.6 \text{ mph}$$

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	4030	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	198	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	802	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	750	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
	Ramp			
Volume, V (vph)	4030	198	802	vph
Peak-hour factor, PHF	0.93	0.90	0.95	

Peak 15-min volume, v ₁₅	1083	55	211	v
Trucks and buses	15	7	6	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.930	0.966	0.971	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	4658	228	870	pcph

Estimation of V₁₂ Merge Areas

$$L = 1139.80 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.595 \text{ Using Equation 2}$$

FM

$$v_{12} = v_{12} (P) = 2771 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v ₁₂	4886	7200	No
FO			
v ₁₂ or v ₁₂	1887 pc/h	(Equation 13-14 or 13-17)	
3 av ₃₄			
Is v ₁₂ or v ₁₂	> 2700 pc/h?	No	
3 av ₃₄			
Is v ₁₂ or v ₁₂	> 1.5 v ₁₂ / 2	Yes	
3 av ₃₄	12		
If yes, v ₁₂	= 2771	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v _{12A}	2999	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_A - 0.00627 L = 19.4 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

$$\text{Intermediate speed variable, } M = 0.294$$

S

$$\text{Space mean speed in ramp influence area, } S_R = 61.8 \text{ mph}$$

R

$$\text{Space mean speed in outer lanes, } S_0 = 65.0 \text{ mph}$$

0

$$\text{Space mean speed for all vehicles, } S = 63.0 \text{ mph}$$

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3881	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	156	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	347	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3881	156	347	vph
Peak-hour factor, PHF	0.93	0.92	0.92	

Peak 15-min volume, v_{15}	1043	42	94	v
Trucks and buses	15	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	4486	178	396	pcph

Estimation of V12 Merge Areas

$$L = 1092.30 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.619 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 2779 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	4664	7200	No
FO			
v_{12} or v_{12}	1707 pc/h	(Equation 13-14 or 13-17)	
3 av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
3 av34			
Is v_{12} or v_{12}	> 1.5 $v_{12} / 2$	Yes	
3 av34	12		
If yes, v_{12}	= 2779	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2957	4600	No
12A			

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 19.1 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

$$\text{Intermediate speed variable, } M = 0.291$$

S

$$\text{Space mean speed in ramp influence area, } S = 61.9 \text{ mph}$$

R

$$\text{Space mean speed in outer lanes, } S = 65.7 \text{ mph}$$

0

$$\text{Space mean speed for all vehicles, } S = 63.2 \text{ mph}$$

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3348	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	218	vph
Length of first accel/decel lane	900	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	292	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1300	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3348	218	292	vph
Peak-hour factor, PHF	0.93	0.90	0.91	

Peak 15-min volume, v_{15}	900	61	80	v
Trucks and buses	15	11	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.948	0.966	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3870	256	332	pcph

Estimation of V12 Merge Areas

$$L = 710.76 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.603 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 2332 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	4126	7200	No
FO			
v_{12} or v_{12}	1538 pc/h	(Equation 13-14 or 13-17)	
v_{12} or v_{12}			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
v_{12} or v_{12}			
Is v_{12} or v_{12}	> 1.5 v_{12} / 2	Yes	
v_{12} or v_{12}			
If yes, v_{12}	= 2332	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2588	4600	No
12A			

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 19.9 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.310$

S

Space mean speed in ramp influence area, $S = 61.3 \text{ mph}$

R

Space mean speed in outer lanes, $S = 66.3 \text{ mph}$

0

Space mean speed for all vehicles, $S = 63.1 \text{ mph}$

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3368	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	69	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	198	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3368	69	198	vph
Peak-hour factor, PHF	0.93	0.90	0.90	

Peak 15-min volume, v_{15}	905	19	55	v
Trucks and buses	15	24	21	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.893	0.905	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3893	86	243	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)

EQ

$P = 1.000$ Using Equation 0

FM

$v_{12} = v_{15} (P_{FM}) = 3893 \text{ pc/h}$

12 F FM

Capacity Checks

v_{12}	Actual 3979	Maximum 4800	LOS F? No
FO			
v_{12} or v_{15}	0 pc/h	(Equation 13-14 or 13-17)	
3 av34			
Is v_{12} or $v_{15} > 2700 \text{ pc/h}$?		No	
3 av34			
Is v_{12} or $v_{15} > 1.5 v_{12} / 2$		No	
3 av34 12			
If yes, $v_{12} = 3893$	(Equation 13-15, 13-16, 13-18, or 13-19)		
12A			

Flow Entering Merge Influence Area

v_{12}	Actual 3979	Max Desirable 4600	Violation? No
R12			

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_{12} + 0.0078 v_A - 0.00627 L = 31.5 \text{ pc/mi/ln}$

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable, $M = 0.474$

S

Space mean speed in ramp influence area, $S = 56.7 \text{ mph}$

R

Space mean speed in outer lanes, $S = \text{N/A} \text{ mph}$

0

Space mean speed for all vehicles, $S = 56.7 \text{ mph}$

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Jedburg Road (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.95
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 718 veh/h
Opposing direction volume, Vo 521 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.2
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.993	0.986
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	761 pc/h	556 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	2.0	mi/h
Average travel speed, ATSD	31.3	mi/h
Percent Free Flow Speed, PFFS	71.9	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	756 pc/h	548 pc/h
Base percent time-spent-following,(note-4) BPTSFd	65.1	%
Adjustment for no-passing zones, fnp	29.9	
Percent time-spent-following, PTSFd	82.4	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.45
Peak 15-min vehicle-miles of travel, VMT15	189 veh-mi
Peak-hour vehicle-miles of travel, VMT60	718 veh-mi
Peak 15-min total travel time, TT15	6.0 veh-h
Capacity from ATS, CdATS	1676 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1676 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	31.3	mi/h
Percent time-spent-following, PTSFd (from above)	82.4	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 755.8
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 6.08
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Jedburg Road (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	60 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 877 veh/h
Opposing direction volume, Vo 1069 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	1.000	1.000
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	953 pc/h	1162 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	0.6	mi/h
Average travel speed, ATSD	26.5	mi/h
Percent Free Flow Speed, PFFS	60.9	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	953 pc/h	1162 pc/h
Base percent time-spent-following,(note-4) BPTSFd	78.4	%
Adjustment for no-passing zones, fnp	15.3	
Percent time-spent-following, PTSFd	85.3	%

Level of Service and Other Performance Measures

Level of service, LOS	E
Volume to capacity ratio, v/c	0.56
Peak 15-min vehicle-miles of travel, VMT15	238 veh-mi
Peak-hour vehicle-miles of travel, VMT60	877 veh-mi
Peak 15-min total travel time, TT15	9.0 veh-h
Capacity from ATS, CdATS	1700 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1700 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	26.5	mi/h
Percent time-spent-following, PTSFd (from above)	85.3	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 953.3
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 6.20
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Volvo Car Drive (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	6.0 ft	% Trucks and buses	10 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	20 %
Up/down	- %	Access point density	8 /mi

Analysis direction volume, Vd 433 veh/h
Opposing direction volume, Vo 779 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.2	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.980	0.990
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	480 pc/h	855 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 0.0 mi/h
Adj. for access point density,(note-3) fA 2.0 mi/h

Free-flow speed, FFSd	48.0	mi/h
Adjustment for no-passing zones, fnp	0.4	mi/h
Average travel speed, ATSD	37.3	mi/h
Percent Free Flow Speed, PFFS	77.7	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	471 pc/h	847 pc/h
Base percent time-spent-following,(note-4) BPTSFd	53.7	%
Adjustment for no-passing zones, fnp	18.3	
Percent time-spent-following, PTSFd	60.2	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.28
Peak 15-min vehicle-miles of travel, VMT15	118 veh-mi
Peak-hour vehicle-miles of travel, VMT60	433 veh-mi
Peak 15-min total travel time, TT15	3.2 veh-h
Capacity from ATS, CdATS	1683 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1683 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	37.3	mi/h
Percent time-spent-following, PTSFd (from above)	60.2	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 470.7
Effective width of outside lane, We 24.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.06
Bicycle LOS E

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 27 (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	7 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	30 /mi

Analysis direction volume, Vd 597 veh/h
Opposing direction volume, Vo 769 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.993	1.000
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	668 pc/h	854 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 7.5 mi/h

Free-flow speed, FFSd	43.3	mi/h
Adjustment for no-passing zones, fnp	1.2	mi/h
Average travel speed, ATSD	30.3	mi/h
Percent Free Flow Speed, PFFS	70.0	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	663 pc/h	854 pc/h
Base percent time-spent-following,(note-4) BPTSFd	64.1	%
Adjustment for no-passing zones, fnp	25.8	
Percent time-spent-following, PTSFd	75.4	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.39
Peak 15-min vehicle-miles of travel, VMT15	166 veh-mi
Peak-hour vehicle-miles of travel, VMT60	597 veh-mi
Peak 15-min total travel time, TT15	5.5 veh-h
Capacity from ATS, CdATS	1700 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1700 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	30.3	mi/h
Percent time-spent-following, PTSFd (from above)	75.4	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 663.3
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 6.15
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 27 (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	10 /mi

Analysis direction volume, Vd 547 veh/h
Opposing direction volume, Vo 667 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.993	0.993
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	612 pc/h	746 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 2.5 mi/h

Free-flow speed, FFSd	49.5	mi/h
Adjustment for no-passing zones, fnp	1.5	mi/h
Average travel speed, ATSD	37.5	mi/h
Percent Free Flow Speed, PFFS	75.8	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	608 pc/h	741 pc/h
Base percent time-spent-following,(note-4) BPTSFd	60.0	%
Adjustment for no-passing zones, fnp	29.3	
Percent time-spent-following, PTSFd	73.2	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.36
Peak 15-min vehicle-miles of travel, VMT15	152 veh-mi
Peak-hour vehicle-miles of travel, VMT60	547 veh-mi
Peak 15-min total travel time, TT15	4.1 veh-h
Capacity from ATS, CdATS	1688 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1688 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	37.5	mi/h
Percent time-spent-following, PTSFd (from above)	73.2	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 607.8
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.97
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 453 (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	24 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	75 %
Up/down	- %	Access point density	4 /mi

Analysis direction volume, Vd 186 veh/h
Opposing direction volume, Vo 214 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.5	1.5
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.893	0.893
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	231 pc/h	266 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.7 mi/h
Adj. for access point density,(note-3) fA 1.0 mi/h

Free-flow speed, FFSd	39.3	mi/h
Adjustment for no-passing zones, fnp	3.2	mi/h
Average travel speed, ATSD	32.2	mi/h
Percent Free Flow Speed, PFFS	82.0	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.977	0.977
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	212 pc/h	243 pc/h
Base percent time-spent-following,(note-4) BPTSFd	24.2	%
Adjustment for no-passing zones, fnp	58.5	
Percent time-spent-following, PTSFd	51.5	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.14
Peak 15-min vehicle-miles of travel, VMT15	52 veh-mi
Peak-hour vehicle-miles of travel, VMT60	186 veh-mi
Peak 15-min total travel time, TT15	1.6 veh-h
Capacity from ATS, CdATS	1518 veh/h
Capacity from PTSF, CdPTSF	1660 veh/h
Directional Capacity	1518 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.2	mi/h
Percent time-spent-following, PTSFd (from above)	51.5	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 206.7
Effective width of outside lane, We 12.50
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 14.44
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 453 (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	24 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	70 %
Up/down	- %	Access point density	16 /mi

Analysis direction volume, Vd 202 veh/h
Opposing direction volume, Vo 288 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.5	1.4
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.893	0.912
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	251 pc/h	351 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 4.0 mi/h

Free-flow speed, FFSd	36.8	mi/h
Adjustment for no-passing zones, fnp	2.5	mi/h
Average travel speed, ATSD	29.6	mi/h
Percent Free Flow Speed, PFFS	80.4	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.977	0.977
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	230 pc/h	328 pc/h
Base percent time-spent-following,(note-4) BPTSFd	27.2	%
Adjustment for no-passing zones, fnp	52.9	
Percent time-spent-following, PTSFd	49.0	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.15
Peak 15-min vehicle-miles of travel, VMT15	56 veh-mi
Peak-hour vehicle-miles of travel, VMT60	202 veh-mi
Peak 15-min total travel time, TT15	1.9 veh-h
Capacity from ATS, CdATS	1550 veh/h
Capacity from PTSF, CdPTSF	1660 veh/h
Directional Capacity	1550 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	29.6	mi/h
Percent time-spent-following, PTSFd (from above)	49.0	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 224.4
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 14.42
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Jedburg Road (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.95
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 521 veh/h
Opposing direction volume, Vo 718 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.2	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.986	0.993
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	556 pc/h	761 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	1.3	mi/h
Average travel speed, ATSD	32.0	mi/h
Percent Free Flow Speed, PFFS	73.5	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	548 pc/h	756 pc/h
Base percent time-spent-following,(note-4) BPTSFd	57.0	%
Adjustment for no-passing zones, fnp	29.9	
Percent time-spent-following, PTSFd	69.6	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.33
Peak 15-min vehicle-miles of travel, VMT15	137 veh-mi
Peak-hour vehicle-miles of travel, VMT60	521 veh-mi
Peak 15-min total travel time, TT15	4.3 veh-h
Capacity from ATS, CdATS	1688 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1688 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.0	mi/h
Percent time-spent-following, PTSFd (from above)	69.6	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 548.4
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.92
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Jedburg Road (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	60 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 1069 veh/h
Opposing direction volume, Vo 877 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	1.000	1.000
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	1162 pc/h	953 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	0.6	mi/h
Average travel speed, ATSD	26.4	mi/h
Percent Free Flow Speed, PFFS	60.8	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	1162 pc/h	953 pc/h
Base percent time-spent-following,(note-4) BPTSFd	81.4	%
Adjustment for no-passing zones, fnp	15.3	
Percent time-spent-following, PTSFd	89.8	%

Level of Service and Other Performance Measures

Level of service, LOS	E
Volume to capacity ratio, v/c	0.68
Peak 15-min vehicle-miles of travel, VMT15	290 veh-mi
Peak-hour vehicle-miles of travel, VMT60	1069 veh-mi
Peak 15-min total travel time, TT15	11.0 veh-h
Capacity from ATS, CdATS	1700 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1700 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	26.4	mi/h
Percent time-spent-following, PTSFd (from above)	89.8	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 1162.0
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 6.30
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Volvo Car Drive (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	6.0 ft	% Trucks and buses	10 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	20 %
Up/down	- %	Access point density	8 /mi

Analysis direction volume, Vd 779 veh/h
Opposing direction volume, Vo 433 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.2
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.990	0.980
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	855 pc/h	480 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 0.0 mi/h
Adj. for access point density,(note-3) fA 2.0 mi/h

Free-flow speed, FFSd	48.0	mi/h
Adjustment for no-passing zones, fnp	0.8	mi/h
Average travel speed, ATSD	36.8	mi/h
Percent Free Flow Speed, PFFS	76.7	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	847 pc/h	471 pc/h
Base percent time-spent-following,(note-4) BPTSFd	68.4	%
Adjustment for no-passing zones, fnp	18.3	
Percent time-spent-following, PTSFd	80.2	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.50
Peak 15-min vehicle-miles of travel, VMT15	212 veh-mi
Peak-hour vehicle-miles of travel, VMT60	779 veh-mi
Peak 15-min total travel time, TT15	5.8 veh-h
Capacity from ATS, CdATS	1666 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1666 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	36.8	mi/h
Percent time-spent-following, PTSFd (from above)	80.2	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 846.7
Effective width of outside lane, We 24.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.36
Bicycle LOS E

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 27 (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	7 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	30 /mi

Analysis direction volume, Vd 769 veh/h
Opposing direction volume, Vo 597 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	1.000	0.993
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	854 pc/h	668 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 7.5 mi/h

Free-flow speed, FFSd	43.3	mi/h
Adjustment for no-passing zones, fnp	1.6	mi/h
Average travel speed, ATSD	29.9	mi/h
Percent Free Flow Speed, PFFS	69.0	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	854 pc/h	663 pc/h
Base percent time-spent-following,(note-4) BPTSFd	70.2	%
Adjustment for no-passing zones, fnp	25.8	
Percent time-spent-following, PTSFd	84.7	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.50
Peak 15-min vehicle-miles of travel, VMT15	214 veh-mi
Peak-hour vehicle-miles of travel, VMT60	769 veh-mi
Peak 15-min total travel time, TT15	7.2 veh-h
Capacity from ATS, CdATS	1688 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1688 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	29.9	mi/h
Percent time-spent-following, PTSFd (from above)	84.7	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 854.4
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 6.27
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 27 (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	10 /mi

Analysis direction volume, Vd 667 veh/h
Opposing direction volume, Vo 547 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.993	0.993
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	746 pc/h	612 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 2.5 mi/h

Free-flow speed, FFSd	49.5	mi/h
Adjustment for no-passing zones, fnp	1.9	mi/h
Average travel speed, ATSD	37.1	mi/h
Percent Free Flow Speed, PFFS	75.0	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	741 pc/h	608 pc/h
Base percent time-spent-following,(note-4) BPTSFd	64.3	%
Adjustment for no-passing zones, fnp	29.3	
Percent time-spent-following, PTSFd	80.4	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.44
Peak 15-min vehicle-miles of travel, VMT15	185 veh-mi
Peak-hour vehicle-miles of travel, VMT60	667 veh-mi
Peak 15-min total travel time, TT15	5.0 veh-h
Capacity from ATS, CdATS	1688 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1688 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	37.1	mi/h
Percent time-spent-following, PTSFd (from above)	80.4	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 741.1
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 6.07
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 453 (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	24 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	75 %
Up/down	- %	Access point density	4 /mi

Analysis direction volume, Vd 214 veh/h
Opposing direction volume, Vo 186 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.5	1.5
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.893	0.893
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	266 pc/h	231 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.7 mi/h
Adj. for access point density,(note-3) fA 1.0 mi/h

Free-flow speed, FFSd	39.3	mi/h
Adjustment for no-passing zones, fnp	3.4	mi/h
Average travel speed, ATSD	32.0	mi/h
Percent Free Flow Speed, PFFS	81.5	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.977	0.977
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	243 pc/h	212 pc/h
Base percent time-spent-following,(note-4) BPTSFd	25.1	%
Adjustment for no-passing zones, fnp	58.5	
Percent time-spent-following, PTSFd	56.3	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.16
Peak 15-min vehicle-miles of travel, VMT15	59 veh-mi
Peak-hour vehicle-miles of travel, VMT60	214 veh-mi
Peak 15-min total travel time, TT15	1.8 veh-h
Capacity from ATS, CdATS	1518 veh/h
Capacity from PTSF, CdPTSF	1660 veh/h
Directional Capacity	1518 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.0	mi/h
Percent time-spent-following, PTSFd (from above)	56.3	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 237.8
Effective width of outside lane, We 12.50
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 14.51
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 453 (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	24 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	70 %
Up/down	- %	Access point density	16 /mi

Analysis direction volume, Vd 288 veh/h
Opposing direction volume, Vo 202 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.4	1.5
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.912	0.893
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	351 pc/h	251 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 4.0 mi/h

Free-flow speed, FFSd 36.8 mi/h

Adjustment for no-passing zones, fnp 3.1 mi/h

Average travel speed, ATSD 29.0 mi/h

Percent Free Flow Speed, PFFS 78.8 %

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.977	0.977
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	328 pc/h	230 pc/h
Base percent time-spent-following,(note-4) BPTSFd	33.1 %	
Adjustment for no-passing zones, fnp	52.9	
Percent time-spent-following, PTSFd	64.2 %	

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.21
Peak 15-min vehicle-miles of travel, VMT15	80 veh-mi
Peak-hour vehicle-miles of travel, VMT60	288 veh-mi
Peak 15-min total travel time, TT15	2.8 veh-h
Capacity from ATS, CdATS	1518 veh/h
Capacity from PTSF, CdPTSF	1660 veh/h
Directional Capacity	1518 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0 mi
Length of two-lane highway upstream of the passing lane, Lu	- mi
Length of passing lane including tapers, Lpl	- mi
Average travel speed, ATSD (from above)	29.0 mi/h
Percent time-spent-following, PTSFd (from above)	64.2
Level of service, LOSd (from above)	C

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	- mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	- mi
Adj. factor for the effect of passing lane on average speed, fpl	-
Average travel speed including passing lane, ATSpl	-
Percent free flow speed including passing lane, PFFSpl	0.0 %

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 320.0
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 14.60
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

June 2019

C.8 2023 BUILD – ALTERNATIVE 3



HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1525	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	55	vph
Length of first accel/decel lane	465	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	142	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1525	55	142	vph
Peak-hour factor, PHF	0.91	0.95	0.90	

Peak 15-min volume, v ₁₅	419	14	39	v
Trucks and buses	24	53	36	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.893	0.791	0.847	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	1877	73	186	pcph

Estimation of V₁₂ Diverge Areas

L = (Equation 13-12 or 13-13)

EQ

P = 1.000 Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 1877$ pc/h

12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
v = v Fi F	1877	4800	No
v = v - v FO F R	1804	4800	No
v R	73	2000	No
v or v 3 av34	0 pc/h	(Equation 13-14 or 13-17)	
Is v or v 3 av34	> 2700 pc/h?	No	
Is v or v 3 av34	> 1.5 v /2	No	
If yes, v = 1877 12A	(Equation 13-15, 13-16, 13-18, or 13-19)		

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1877	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 16.2$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.435$

S

Space mean speed in ramp influence area, $S = 57.8$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 57.8 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1612	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	119	vph
Length of first accel/decel lane	250	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	507	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	4000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1612	119	507	vph
Peak-hour factor, PHF	0.91	0.90	0.90	

Peak 15-min volume, v_{15}	443	33	141	v
Trucks and buses	24	23	16	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.897	0.926	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	1984	147	608	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.704$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 1440$ pc/h

$v_{12} = 1440$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	1984	7200	No
$v_{12} = v_F$			
$v_{12} = v_F - v_R$	1837	7200	No
$v_{12} = v_F - v_R$			
$v_{12} = v_R$	147	2000	No
$v_{12} = v_R$			
$v_{12} = v_F$ or $v_{12} = v_R$	544 pc/h	(Equation 13-14 or 13-17)	
$v_{12} = v_F$ or $v_{12} = v_R$			
Is $v_{12} = v_F$ or $v_{12} = v_R$ > 2700 pc/h?		No	
Is $v_{12} = v_F$ or $v_{12} = v_R$ > 1.5 $v_{12} / 2$		No	
If yes, $v_{12} = 1440$	(Equation 13-15, 13-16, 13-18, or 13-19)		
$v_{12} = 1440$			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1440	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 14.4$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.441$

S

Space mean speed in ramp influence area, $S = 57.6$ mph

R

Space mean speed in outer lanes, S = 76.8 mph

0

Space mean speed for all vehicles, S = 61.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2000	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	98	vph
Length of first accel/decel lane	1200	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	89	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	3500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2000	98	89	vph
Peak-hour factor, PHF	0.91	0.92	0.92	

Peak 15-min volume, v_{15}	549	27	24	v
Trucks and buses	24	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2462	112	102	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.693$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 1741$ pc/h

$v_{12} = 1741$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	2462	7200	No
$v_{12} = v_F - v_R$	2350	7200	No
$v_{12} = v_R$	112	2000	No
v_{12} or v_{12}	721 pc/h	(Equation 13-14 or 13-17)	
Is v_{12} or $v_{12} > 2700$ pc/h?		No	
Is v_{12} or $v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 1741$	(Equation 13-15, 13-16, 13-18, or 13-19)		
$v_{12} = 1741$			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1741	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 8.4$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable, $D = 0.438$

S

Space mean speed in ramp influence area, $S = 57.7$ mph

R

Space mean speed in outer lanes, S = 76.8 mph

0

Space mean speed for all vehicles, S = 62.3 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1991	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	145	vph
Length of first accel/decel lane	180	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	864	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2900	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1991	145	864	vph
Peak-hour factor, PHF	0.91	0.90	0.90	

Peak 15-min volume, v_{15}	547	40	240	v
Trucks and buses	24	29	11	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.873	0.948	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2450	184	1013	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.690$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 1748$ pc/h

$v_{12} = 1748$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	2450	7200	No
$v_{12} = v_F + (v_R - v_F) P$	2266	7200	No
$v_{12} = v_R$	184	2000	No
$v_{12} = v_F$ or $v_{12} = v_R$	702 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} > 2700$ pc/h?		No	
Is $v_{12} > 1.5 v_F / 2$		No	
If yes, $v_{12} = 1748$	(Equation 13-15, 13-16, 13-18, or 13-19)		

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1748	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 17.7$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.445$

S

Space mean speed in ramp influence area, $S = 57.6$ mph

R

Space mean speed in outer lanes, S = 76.8 mph

0

Space mean speed for all vehicles, S = 62.0 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2750	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	316	vph
Length of first accel/decel lane	850	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	151	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	750	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2750	316	151	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v ₁₅	747	88	42	v
Trucks and buses	22	10	11	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.901	0.952	0.948	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	3318	369	177	pcph

Estimation of V₁₂ Diverge Areas

L = (Equation 13-12 or 13-13)

EQ

P = 0.660 Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 2316$ pc/h

12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	3318	7200	No
$v_{12} = v_F - v_R$	2949	7200	No
$v_{12} = v_F$	369	2000	No
v_{12} or v_{12}	1002 pc/h	(Equation 13-14 or 13-17)	
Is v_{12} or $v_{12} > 2700$ pc/h?		No	
Is v_{12} or $v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 2316$	(Equation 13-15, 13-16, 13-18, or 13-19)		
12A			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2316	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 16.5$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.461$

S

Space mean speed in ramp influence area, $S = 57.1$ mph

R

Space mean speed in outer lanes, S = 76.8 mph

0

Space mean speed for all vehicles, S = 61.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2902	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	152	vph
Length of first accel/decel lane	150	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	316	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	920	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2902	152	316	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v_{15}	789	42	88	v
Trucks and buses	22	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3501	177	369	pcph

Estimation of V12 Diverge Areas

$$L = 379.52 \text{ (Equation 13-12 or 13-13)}$$

EQ

$$P = 0.664 \text{ Using Equation 5}$$

FD

$$v_{12} = v_F + (v_R - v_F) P = 2385 \text{ pc/h}$$

12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	3501	7200	No
$v_{12} = v_F - v_R$	3324	7200	No
$v_{12} = v_F$	177	2000	No
$v_{12} \text{ or } v_{12}$	1116 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_{12} > 2700 \text{ pc/h?}$		No	
Is $v_{12} \text{ or } v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 2385$	(Equation 13-15, 13-16, 13-18, or 13-19)		
12A			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2385	4400	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L = 23.4 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

$$\text{Intermediate speed variable, } D = 0.444$$

S

$$\text{Space mean speed in ramp influence area, } S = 57.6 \text{ mph}$$

R

Space mean speed in outer lanes, S = 76.3 mph

0

Space mean speed for all vehicles, S = 62.5 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2585	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	394	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane	1500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	23	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2585	394	23	vph
Peak-hour factor, PHF	0.92	0.92	0.92	

Peak 15-min volume, v ₁₅	702	107	6	v
Trucks and buses	22	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.901	0.952	0.952	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	3119	450	26	pcph

Estimation of V12 Diverge Areas

L = (Equation 13-12 or 13-13)

EQ

P = 0.450 Using Equation 0

FD

$v_{12R} = v_F + (v - v_F) P = 1651$ pc/h

12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12R} = v_F$	3119	7200	No
$v_{12R} = v_F - v_{12R}$	2669	7200	No
v_{12R}	450	4000	No
v_{12R} or v_{12R}	1468 pc/h	(Equation 13-14 or 13-17)	
Is v_{12R} or $v_{12R} > 2700$ pc/h?		No	
Is v_{12R} or $v_{12R} > 1.5 v_{12R} / 2$		Yes	
If yes, $v_{12A} = 1782$	(Equation 13-15, 13-16, 13-18, or 13-19)		
12A			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	1782	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12R} - 0.009 L = -20.9$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable, $D = 0.469$

S

Space mean speed in ramp influence area, $S = 56.9$ mph

R

Space mean speed in outer lanes, S = 75.5 mph

0

Space mean speed for all vehicles, S = 63.6 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2012	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	174	vph
Length of first accel/decel lane	250	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	117	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1300	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2012	174	117	vph
Peak-hour factor, PHF	0.92	0.94	0.90	

Peak 15-min volume, v_{15}	547	46	33	v
Trucks and buses	22	25	16	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.889	0.926	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2428	208	140	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.690$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 1739$ pc/h

$v_{12} = 1739$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	2428	7200	No
$v_{12} = v_F + (v_R - v_F) P$	2220	7200	No
$v_{12} = v_R$	208	2000	No
$v_{12} = v_F$ or $v_{12} = v_R$	689 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} > 2700$ pc/h?		No	
Is $v_{12} > 1.5 v_F / 2$		No	
If yes, $v_{12} = 1739$	(Equation 13-15, 13-16, 13-18, or 13-19)		

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1739	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 17.0$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.447$

S

Space mean speed in ramp influence area, $S = 57.5$ mph

R

Space mean speed in outer lanes, S = 76.8 mph

0

Space mean speed for all vehicles, S = 61.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2214	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	202	vph
Length of first accel/decel lane	250	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	174	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	1775	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2214	202	174	vph
Peak-hour factor, PHF	0.92	0.94	0.94	

Peak 15-min volume, v_{15}	602	54	46	v
Trucks and buses	22	25	25	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.889	0.889	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2671	242	208	pcph

Estimation of V12 Diverge Areas

$$L = 213.35 \text{ (Equation 13-12 or 13-13)}$$

EQ

$$P = 0.682 \text{ Using Equation 5}$$

FD

$$v_{12} = v_F + (v_R - v_F) P = 1899 \text{ pc/h}$$

12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	2671	7200	No
$v_{12} = v_F - v_R$	2429	7200	No
$v_{12} = v_F$	242	2000	No
$v_{12} \text{ or } v_{12}$	772 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_{12} > 2700 \text{ pc/h?}$		No	
Is $v_{12} \text{ or } v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 1899$	(Equation 13-15, 13-16, 13-18, or 13-19)		
12A			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1899	4400	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L = 18.3 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

$$\text{Intermediate speed variable, } D = 0.450$$

S

$$\text{Space mean speed in ramp influence area, } S = 57.4 \text{ mph}$$

R

Space mean speed in outer lanes, S = 76.8 mph

0

Space mean speed for all vehicles, S = 61.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1955	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	161	vph
Length of first accel/decel lane	475	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	54	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1955	161	54	vph
Peak-hour factor, PHF	0.92	0.90	0.92	

Peak 15-min volume, v_{15}	531	45	15	v
Trucks and buses	22	46	36	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.813	0.847	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2359	220	69	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 2359$ pc/h

$v_{12} = 2359$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	2359	4800	No
$v_{12} = v_F$			
$v_{12} = v_F - v_R$	2139	4800	No
$v_{12} = v_F - v_R$			
$v_{12} = v_R$	220	2000	No
$v_{12} = v_R$			
$v_{12} = v_F$ or $v_{12} = v_R$	0 pc/h	(Equation 13-14 or 13-17)	
$v_{12} = v_F$ or $v_{12} = v_R$			
Is $v_{12} = v_F$ or $v_{12} = v_R$ > 2700 pc/h?		No	
Is $v_{12} = v_F$ or $v_{12} = v_R$ > 1.5 $v_{12} / 2$		No	
If yes, $v_{12} = 2359$		(Equation 13-15, 13-16, 13-18, or 13-19)	
$v_{12} = 2359$			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2359	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 20.3$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.448$

S

Space mean speed in ramp influence area, $S = 57.5$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 57.5 mph

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: West of SC 453
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1525	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	419	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	938	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.2	mi/h
Free-flow speed, FFS	72.2	mi/h

LOS and Performance Measures

Flow rate, vp	938	pc/h/ln
Free-flow speed, FFS	72.2	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	2	
Density, D	13.4	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Between SC 453 Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1470	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	404	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	905	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.33	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.3	mi/h
Free-flow speed, FFS	74.1	mi/h

LOS and Performance Measures

Flow rate, vp	905	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	2	
Density, D	12.1	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: SC 453 to SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1612	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	443	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	992	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	992	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	2	
Density, D	13.2	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Between SC 27 Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1493	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	410	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	613	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	613	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	8.2	pc/mi/ln
Level of service, LOS	A	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Between SC 27 & Volvo
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2000	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	549	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	821	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, v_p	821	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	10.9	pc/mi/ln
Level of service, LOS	A	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Between Volvo Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1902	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	523	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	780	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	780	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	10.4	pc/mi/ln
Level of service, LOS	A	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Volvo to Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1991	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	547	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	817	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	817	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	10.9	pc/mi/ln
Level of service, LOS	A	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1846	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	507	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	757	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.50	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.8	mi/h
Free-flow speed, FFS	73.6	mi/h

LOS and Performance Measures

Flow rate, vp	757	pc/h/ln
Free-flow speed, FFS	73.6	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	10.1	pc/mi/ln
Level of service, LOS	A	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Jedburg to Nexton
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2710	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	745	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	1112	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.20	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.8	mi/h
Free-flow speed, FFS	71.6	mi/h

LOS and Performance Measures

Flow rate, vp	1112	pc/h/ln
Free-flow speed, FFS	71.6	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	3	
Density, D	15.9	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Nexton to Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2902	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	789	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1167	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.33	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	4.1	mi/h
Free-flow speed, FFS	71.3	mi/h

LOS and Performance Measures

Flow rate, vp	1167	pc/h/ln
Free-flow speed, FFS	71.3	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	3	
Density, D	16.7	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2434	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	661	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	979	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	979	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	13.1	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2750	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	747	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1106	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1106	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	74.9	mi/h
Number of lanes, N	3	
Density, D	14.8	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Jeddburg to Volvo
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2585	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	702	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1040	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	1040	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	13.9	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between Volvo Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2191	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	595	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	881	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, v_p	881	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	11.7	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between Volvo & SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2214	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	602	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	890	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	890	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	11.9	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between SC 27 Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1838	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	499	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	739	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	739	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	9.9	pc/mi/ln
Level of service, LOS	A	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between SC 27 Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2012	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	547	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	809	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	809	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	10.8	pc/mi/ln
Level of service, LOS	A	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: SC 27 to SC 453
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1955	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	531	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1179	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	1179	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	74.6	mi/h
Number of lanes, N	2	
Density, D	15.8	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between SC 453 Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1794	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	487	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1082	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.33	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.3	mi/h
Free-flow speed, FFS	74.1	mi/h

LOS and Performance Measures

Flow rate, vp	1082	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	74.9	mi/h
Number of lanes, N	2	
Density, D	14.4	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: West of SC 453
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1898	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	516	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1145	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.2	mi/h
Free-flow speed, FFS	72.2	mi/h

LOS and Performance Measures

Flow rate, vp	1145	pc/h/ln
Free-flow speed, FFS	72.2	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	2	
Density, D	16.4	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1470	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	142	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	55	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1470	142	55	vph
Peak-hour factor, PHF	0.91	0.90	0.95	

Peak 15-min volume, v ₁₅	404	39	14	v
Trucks and buses	24	36	53	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.893	0.847	0.791	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	1809	186	73	pcph

Estimation of V₁₂ Merge Areas

L = (Equation 13-6 or 13-7)

EQ

P = 1.000 Using Equation 0

FM

v = v₁₂ (P) = 1809 pc/h

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v ₁₂	1995	4800	No
FO			
v ₃ or v _{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v ₃ or v _{av34} > 2700 pc/h?		No	
Is v ₃ or v _{av34} > 1.5 v ₁₂ / 2		No	
If yes, v _{12A} = 1809		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v ₁₂	1995	4600	No
R12			

Level of Service Determination (if not F)

Density, D = $5.475 + 0.00734 v_{12} + 0.0078 v_A - 0.00627 L$ = 15.9 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, M = 0.294

S

Space mean speed in ramp influence area, S = 61.8 mph

R

Space mean speed in outer lanes, S = N/A mph

0

Space mean speed for all vehicles, S = 61.8 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1493	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	507	vph
Length of first accel/decel lane	900	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	119	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	4000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1493	507	119	vph
Peak-hour factor, PHF	0.91	0.90	0.90	

Peak 15-min volume, v_{15}	410	141	33	v
Trucks and buses	24	16	23	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.926	0.897	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	1838	608	147	pcph

Estimation of V12 Merge Areas

$$L = 351.24 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.603 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 1108 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	2446	7200	No
FO			
v_{12} or v_{12}	730 pc/h	(Equation 13-14 or 13-17)	
v_{12} or v_{12}			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
v_{12} or v_{12}			
Is v_{12} or v_{12}	> 1.5 v_{12} / 2	Yes	
v_{12} or v_{12}			
If yes, v_{12}	= 1108	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1716	4600	No
12A			

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 12.9 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.280$

S

Space mean speed in ramp influence area, $S = 62.2 \text{ mph}$

R

Space mean speed in outer lanes, $S = 69.2 \text{ mph}$

0

Space mean speed for all vehicles, $S = 64.1 \text{ mph}$

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1902	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-flow speed on ramp	35.0	mph
Volume on ramp	89	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane	1500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	98	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	3500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1902	89	98	vph
Peak-hour factor, PHF	0.91	0.92	0.92	

Peak 15-min volume, v_{15}	523	24	27	v
Trucks and buses	24	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2341	102	112	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)

EQ

$P = 0.555$ Using Equation 0

FM

$v = v(P) = 1299$ pc/h

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v	2443	7200	No
FO			
v or v_3	1042 pc/h	(Equation 13-14 or 13-17)	
v_3 av34			
Is v or v_3	> 2700 pc/h?	No	
v_3 av34			
Is v or v_3	$> 1.5 v / 2$	Yes	
v_3 av34	12		
If yes, v_{12A}	1337	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	1439	4600	No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_A - 0.00627 L = -11.6$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable, $M = 0.022$

S

Space mean speed in ramp influence area, $S_R = 69.4$ mph

R

Space mean speed in outer lanes, $S_0 = 68.2$ mph

0

Space mean speed for all vehicles, $S = 68.9$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1846	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	864	vph
Length of first accel/decel lane	1120	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	145	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2900	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1846	864	145	vph
Peak-hour factor, PHF	0.91	0.90	0.90	

Peak 15-min volume, v_{15}	507	240	40	v
Trucks and buses	24	11	29	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.948	0.873	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2272	1013	184	pcph

Estimation of V12 Merge Areas

$$L = 628.47 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.609 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 1383 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	3285	7200	No
FO			
v_{12} or v_{12}	889 pc/h	(Equation 13-14 or 13-17)	
3 av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
3 av34			
Is v_{12} or v_{12}	> 1.5 $v_{12} / 2$	Yes	
3 av34	12		
If yes, v_{12}	= 1383	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2396	4600	No
12A			

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 16.7 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

$$\text{Intermediate speed variable, } M = 0.285$$

S

$$\text{Space mean speed in ramp influence area, } S = 62.0 \text{ mph}$$

R

$$\text{Space mean speed in outer lanes, } S = 68.6 \text{ mph}$$

0

$$\text{Space mean speed for all vehicles, } S = 63.7 \text{ mph}$$

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2434	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	151	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	316	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	750	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2434	151	316	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v ₁₅	661	42	88	v
Trucks and buses	22	11	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.901	0.948	0.952	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	2937	177	369	pcph

Estimation of V₁₂ Merge Areas

$$L = 760.60 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.619 \text{ Using Equation 2}$$

FM

$$v_{12} = v_{12} (P) = 1817 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v	3114	7200	No
FO			
v or v ₃	1120 pc/h	(Equation 13-14 or 13-17)	
av ₃₄			
Is v or v ₃	> 2700 pc/h?	No	
av ₃₄			
Is v or v ₃	> 1.5 v ₁₂ / 2	Yes	
av ₃₄	12		
If yes, v _{12A}	= 1817	(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v	1994	4600	No
12A			

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_R + 0.0078 v_A - 0.00627 L = 11.5 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, M = 0.245

S

Space mean speed in ramp influence area, S = 63.1 mph

R

Space mean speed in outer lanes, S = 67.8 mph

0

Space mean speed for all vehicles, S = 64.7 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2191	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	23	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	394	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2191	23	394	vph
Peak-hour factor, PHF	0.92	0.92	0.92	

Peak 15-min volume, v_{15}	595	6	107	v
Trucks and buses	22	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2643	26	450	pcph

Estimation of V12 Merge Areas

$$L = 665.37 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.619 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 1637 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	2669	7200	No
FO			
v_{12} or v_{12}	1006 pc/h	(Equation 13-14 or 13-17)	
v_{12} or v_{12}			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
v_{12} or v_{12}			
Is v_{12} or v_{12}	> 1.5 v_{12} / 2	Yes	
v_{12} or v_{12}			
If yes, v_{12}	= 1637	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1663	4600	No
12A			

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 9.0 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

$$\text{Intermediate speed variable, } M = 0.237$$

S

$$\text{Space mean speed in ramp influence area, } S = 63.4 \text{ mph}$$

R

$$\text{Space mean speed in outer lanes, } S = 68.2 \text{ mph}$$

0

$$\text{Space mean speed for all vehicles, } S = 65.1 \text{ mph}$$

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1838	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	117	vph
Length of first accel/decel lane	900	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	174	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1300	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1838	117	174	vph
Peak-hour factor, PHF	0.92	0.90	0.94	

Peak 15-min volume, v ₁₅	499	33	46	v
Trucks and buses	22	16	25	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.901	0.926	0.889	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	2218	140	208	pcph

Estimation of V₁₂ Merge Areas

$$L = 332.41 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.603 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 1337 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v	2358	7200	No
FO			
v or v ₃	881 pc/h	(Equation 13-14 or 13-17)	
av ₃₄			
Is v or v ₃ > 2700 pc/h?		No	
av ₃₄			
Is v or v ₃ > 1.5 v ₁₂ / 2		Yes	
av ₃₄ 12			
If yes, v _{12A} = 1337		(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v	1477	4600	No
12A			

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_R + 0.0078 v_A - 0.00627 L = 11.3 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

$$\text{Intermediate speed variable, } M = 0.275$$

S

$$\text{Space mean speed in ramp influence area, } S_R = 62.3 \text{ mph}$$

R

$$\text{Space mean speed in outer lanes, } S_0 = 68.6 \text{ mph}$$

0

$$\text{Space mean speed for all vehicles, } S = 64.5 \text{ mph}$$

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1794	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	54	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	161	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1794	54	161	vph
Peak-hour factor, PHF	0.92	0.92	0.90	

Peak 15-min volume, v ₁₅	487	15	45	v
Trucks and buses	22	36	46	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.901	0.847	0.813	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	2164	69	220	pcph

Estimation of V12 Merge Areas

L = (Equation 13-6 or 13-7)

EQ

P = 1.000 Using Equation 0

FM

v = v₁₂ (P) = 2164 pc/h

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v	2233	4800	No
FO			
v or v ₃	0 pc/h	(Equation 13-14 or 13-17)	
av ₃₄			
Is v or v ₃	> 2700 pc/h?	No	
av ₃₄			
Is v or v ₃	> 1.5 v ₁₂ / 2	No	
av ₃₄	12		
If yes, v _{12A}	= 2164	(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v	2233	4600	No
R12			

Level of Service Determination (if not F)

Density, D = $5.475 + 0.00734 v_R + 0.0078 v_A - 0.00627 L$ = 17.8 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, M = 0.301

S

Space mean speed in ramp influence area, S = 61.6 mph

R

Space mean speed in outer lanes, S = N/A mph

0

Space mean speed for all vehicles, S = 61.6 mph

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Jedburg Road (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.93
Shoulder width	2.5 ft	% Trucks and buses	11 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 352 veh/h
Opposing direction volume, Vo 562 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.3	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.968	0.989
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	391 pc/h	611 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	1.8	mi/h
Average travel speed, ATSD	34.0	mi/h
Percent Free Flow Speed, PFFS	78.1	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.989	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	383 pc/h	604 pc/h
Base percent time-spent-following,(note-4) BPTSFd	44.0	%
Adjustment for no-passing zones, fnp	36.1	
Percent time-spent-following, PTSFd	58.0	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.23
Peak 15-min vehicle-miles of travel, VMT15	95 veh-mi
Peak-hour vehicle-miles of travel, VMT60	352 veh-mi
Peak 15-min total travel time, TT15	2.8 veh-h
Capacity from ATS, CdATS	1681 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1681 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	34.0	mi/h
Percent time-spent-following, PTSFd (from above)	58.0	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 378.5
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 7.27
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Jedburg Road (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.94
Shoulder width	2.5 ft	% Trucks and buses	11 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	60 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 777 veh/h
Opposing direction volume, Vo 535 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.989	0.989
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	836 pc/h	575 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	1.4	mi/h
Average travel speed, ATSD	31.2	mi/h
Percent Free Flow Speed, PFFS	71.6	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	827 pc/h	569 pc/h
Base percent time-spent-following,(note-4) BPTSFd	67.7	%
Adjustment for no-passing zones, fnp	25.6	
Percent time-spent-following, PTSFd	82.9	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.49
Peak 15-min vehicle-miles of travel, VMT15	207 veh-mi
Peak-hour vehicle-miles of travel, VMT60	777 veh-mi
Peak 15-min total travel time, TT15	6.6 veh-h
Capacity from ATS, CdATS	1681 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1681 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	31.2	mi/h
Percent time-spent-following, PTSFd (from above)	82.9	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 826.6
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 7.66
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Volvo Car Drive (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	6.0 ft	% Trucks and buses	10 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	20 %
Up/down	- %	Access point density	8 /mi

Analysis direction volume, Vd 492 veh/h
Opposing direction volume, Vo 112 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.2	1.8
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.980	0.926
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	546 pc/h	131 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 0.0 mi/h
Adj. for access point density,(note-3) fA 2.0 mi/h

Free-flow speed, FFSd	48.0	mi/h
Adjustment for no-passing zones, fnp	0.4	mi/h
Average travel speed, ATSD	42.3	mi/h
Percent Free Flow Speed, PFFS	88.1	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	0.990
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	535 pc/h	123 pc/h
Base percent time-spent-following,(note-4) BPTSFd	46.9	%
Adjustment for no-passing zones, fnp	21.6	
Percent time-spent-following, PTSFd	64.5	%

Level of Service and Other Performance Measures

Level of service, LOS	B
Volume to capacity ratio, v/c	0.32
Peak 15-min vehicle-miles of travel, VMT15	134 veh-mi
Peak-hour vehicle-miles of travel, VMT60	492 veh-mi
Peak 15-min total travel time, TT15	3.2 veh-h
Capacity from ATS, CdATS	1574 veh/h
Capacity from PTSF, CdPTSF	1683 veh/h
Directional Capacity	1574 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	42.3	mi/h
Percent time-spent-following, PTSFd (from above)	64.5	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 534.8
Effective width of outside lane, We 24.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.13
Bicycle LOS E

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 27 (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.93
Shoulder width	1.0 ft	% Trucks and buses	16 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	30 /mi

Analysis direction volume, Vd 415 veh/h
Opposing direction volume, Vo 379 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.3	1.3
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.954	0.954
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	468 pc/h	427 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 7.5 mi/h

Free-flow speed, FFSd	43.3	mi/h
Adjustment for no-passing zones, fnp	2.6	mi/h
Average travel speed, ATSD	33.8	mi/h
Percent Free Flow Speed, PFFS	78.0	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	446 pc/h	408 pc/h
Base percent time-spent-following,(note-4) BPTSFd	45.4	%
Adjustment for no-passing zones, fnp	43.9	
Percent time-spent-following, PTSFd	68.3	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.27
Peak 15-min vehicle-miles of travel, VMT15	112 veh-mi
Peak-hour vehicle-miles of travel, VMT60	415 veh-mi
Peak 15-min total travel time, TT15	3.3 veh-h
Capacity from ATS, CdATS	1622 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1622 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	33.8	mi/h
Percent time-spent-following, PTSFd (from above)	68.3	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 446.2
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 9.87
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
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Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 27 (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.91
Shoulder width	2.5 ft	% Trucks and buses	16 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	10 /mi

Analysis direction volume, Vd 526 veh/h
Opposing direction volume, Vo 363 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.3
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.984	0.954
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	587 pc/h	418 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 2.5 mi/h

Free-flow speed, FFSd	49.5	mi/h
Adjustment for no-passing zones, fnp	2.6	mi/h
Average travel speed, ATSD	39.1	mi/h
Percent Free Flow Speed, PFFS	78.9	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	0.984
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	578 pc/h	405 pc/h
Base percent time-spent-following,(note-4) BPTSFd	53.9	%
Adjustment for no-passing zones, fnp	37.4	
Percent time-spent-following, PTSFd	75.9	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.35
Peak 15-min vehicle-miles of travel, VMT15	145 veh-mi
Peak-hour vehicle-miles of travel, VMT60	526 veh-mi
Peak 15-min total travel time, TT15	3.7 veh-h
Capacity from ATS, CdATS	1622 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1622 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	39.1	mi/h
Percent time-spent-following, PTSFd (from above)	75.9	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 578.0
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 9.87
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 453 (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	1.0 ft	% Trucks and buses	36 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	75 %
Up/down	- %	Access point density	4 /mi

Analysis direction volume, Vd 196 veh/h
Opposing direction volume, Vo 127 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.5	1.7
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.847	0.799
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	252 pc/h	173 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.7 mi/h
Adj. for access point density,(note-3) fA 1.0 mi/h

Free-flow speed, FFSd	39.3	mi/h
Adjustment for no-passing zones, fnp	3.2	mi/h
Average travel speed, ATSD	32.8	mi/h
Percent Free Flow Speed, PFFS	83.4	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.965	0.965
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	221 pc/h	143 pc/h
Base percent time-spent-following,(note-4) BPTSFd	23.5	%
Adjustment for no-passing zones, fnp	53.7	
Percent time-spent-following, PTSFd	56.1	%

Level of Service and Other Performance Measures

Level of service, LOS	B
Volume to capacity ratio, v/c	0.15
Peak 15-min vehicle-miles of travel, VMT15	53 veh-mi
Peak-hour vehicle-miles of travel, VMT60	196 veh-mi
Peak 15-min total travel time, TT15	1.6 veh-h
Capacity from ATS, CdATS	1358 veh/h
Capacity from PTSF, CdPTSF	1641 veh/h
Directional Capacity	1358 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.8	mi/h
Percent time-spent-following, PTSFd (from above)	56.1	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 213.0
Effective width of outside lane, We 12.50
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 24.27
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 453 (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	36 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	70 %
Up/down	- %	Access point density	16 /mi

Analysis direction volume, Vd 190 veh/h
Opposing direction volume, Vo 159 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.5	1.6
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.847	0.822
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	249 pc/h	215 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 4.0 mi/h

Free-flow speed, FFSd	36.8	mi/h
Adjustment for no-passing zones, fnp	3.4	mi/h
Average travel speed, ATSD	29.8	mi/h
Percent Free Flow Speed, PFFS	81.1	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.965	0.965
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	219 pc/h	183 pc/h
Base percent time-spent-following,(note-4) BPTSFd	23.3	%
Adjustment for no-passing zones, fnp	58.9	
Percent time-spent-following, PTSFd	55.4	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.15
Peak 15-min vehicle-miles of travel, VMT15	53 veh-mi
Peak-hour vehicle-miles of travel, VMT60	190 veh-mi
Peak 15-min total travel time, TT15	1.8 veh-h
Capacity from ATS, CdATS	1397 veh/h
Capacity from PTSF, CdPTSF	1641 veh/h
Directional Capacity	1397 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	29.8	mi/h
Percent time-spent-following, PTSFd (from above)	55.4	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 211.1
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 24.20
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Jedburg Road (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.93
Shoulder width	2.5 ft	% Trucks and buses	11 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 562 veh/h
Opposing direction volume, Vo 352 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.3
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.989	0.968
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	611 pc/h	391 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	2.8	mi/h
Average travel speed, ATSD	33.0	mi/h
Percent Free Flow Speed, PFFS	75.8	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	0.989
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	604 pc/h	383 pc/h
Base percent time-spent-following,(note-4) BPTSFd	54.8	%
Adjustment for no-passing zones, fnp	36.1	
Percent time-spent-following, PTSFd	76.9	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.36
Peak 15-min vehicle-miles of travel, VMT15	151 veh-mi
Peak-hour vehicle-miles of travel, VMT60	562 veh-mi
Peak 15-min total travel time, TT15	4.6 veh-h
Capacity from ATS, CdATS	1646 veh/h
Capacity from PTSF, CdPTSF	1682 veh/h
Directional Capacity	1646 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	33.0	mi/h
Percent time-spent-following, PTSFd (from above)	76.9	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 604.3
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 7.50
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Jedburg Road (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.94
Shoulder width	2.5 ft	% Trucks and buses	11 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	60 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 535 veh/h
Opposing direction volume, Vo 777 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.989	0.989
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	575 pc/h	836 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	0.8	mi/h
Average travel speed, ATSD	31.8	mi/h
Percent Free Flow Speed, PFFS	73.1	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	569 pc/h	827 pc/h
Base percent time-spent-following,(note-4) BPTSFd	59.4	%
Adjustment for no-passing zones, fnp	25.6	
Percent time-spent-following, PTSFd	69.8	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.34
Peak 15-min vehicle-miles of travel, VMT15	142 veh-mi
Peak-hour vehicle-miles of travel, VMT60	535 veh-mi
Peak 15-min total travel time, TT15	4.5 veh-h
Capacity from ATS, CdATS	1681 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1681 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	31.8	mi/h
Percent time-spent-following, PTSFd (from above)	69.8	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 569.1
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 7.47
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Volvo Car Drive (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	6.0 ft	% Trucks and buses	10 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	20 %
Up/down	- %	Access point density	8 /mi

Analysis direction volume, Vd 112 veh/h
Opposing direction volume, Vo 492 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.8	1.2
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.926	0.980
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	131 pc/h	546 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 0.0 mi/h
Adj. for access point density,(note-3) fA 2.0 mi/h

Free-flow speed, FFSd	48.0	mi/h
Adjustment for no-passing zones, fnp	0.7	mi/h
Average travel speed, ATSD	42.1	mi/h
Percent Free Flow Speed, PFFS	87.7	%

Percent Time-Spent-Following

Direction	Analysis(d)	Oposing (o)
PCE for trucks, ET	1.1	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.990	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	123 pc/h	535 pc/h
Base percent time-spent-following,(note-4) BPTSFd	18.7	%
Adjustment for no-passing zones, fnp	21.6	
Percent time-spent-following, PTSFd	22.7	%

Level of Service and Other Performance Measures

Level of service, LOS	B
Volume to capacity ratio, v/c	0.08
Peak 15-min vehicle-miles of travel, VMT15	30 veh-mi
Peak-hour vehicle-miles of travel, VMT60	112 veh-mi
Peak 15-min total travel time, TT15	0.7 veh-h
Capacity from ATS, CdATS	1666 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1666 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	42.1	mi/h
Percent time-spent-following, PTSFd (from above)	22.7	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 121.7
Effective width of outside lane, We 31.92
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 2.16
Bicycle LOS B

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 27 (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.93
Shoulder width	1.0 ft	% Trucks and buses	16 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	30 /mi

Analysis direction volume, Vd 379 veh/h
Opposing direction volume, Vo 415 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.3	1.3
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.954	0.954
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	427 pc/h	468 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 7.5 mi/h

Free-flow speed, FFSd	43.3	mi/h
Adjustment for no-passing zones, fnp	2.4	mi/h
Average travel speed, ATSD	34.0	mi/h
Percent Free Flow Speed, PFFS	78.4	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	408 pc/h	446 pc/h
Base percent time-spent-following,(note-4) BPTSFd	45.0	%
Adjustment for no-passing zones, fnp	43.9	
Percent time-spent-following, PTSFd	66.0	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.25
Peak 15-min vehicle-miles of travel, VMT15	102 veh-mi
Peak-hour vehicle-miles of travel, VMT60	379 veh-mi
Peak 15-min total travel time, TT15	3.0 veh-h
Capacity from ATS, CdATS	1622 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1622 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	34.0	mi/h
Percent time-spent-following, PTSFd (from above)	66.0	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 407.5
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 9.83
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 27 (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.91
Shoulder width	2.5 ft	% Trucks and buses	16 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	10 /mi

Analysis direction volume, Vd 363 veh/h
Opposing direction volume, Vo 526 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.3	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.954	0.984
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	418 pc/h	587 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 2.5 mi/h

Free-flow speed, FFSd	49.5	mi/h
Adjustment for no-passing zones, fnp	1.9	mi/h
Average travel speed, ATSD	39.8	mi/h
Percent Free Flow Speed, PFFS	80.3	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.984	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	405 pc/h	578 pc/h
Base percent time-spent-following,(note-4) BPTSFd	46.0	%
Adjustment for no-passing zones, fnp	37.4	
Percent time-spent-following, PTSFd	61.4	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.25
Peak 15-min vehicle-miles of travel, VMT15	100 veh-mi
Peak-hour vehicle-miles of travel, VMT60	363 veh-mi
Peak 15-min total travel time, TT15	2.5 veh-h
Capacity from ATS, CdATS	1673 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1673 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	39.8	mi/h
Percent time-spent-following, PTSFd (from above)	61.4	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 398.9
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 9.68
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 453 (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	1.0 ft	% Trucks and buses	36 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	75 %
Up/down	- %	Access point density	4 /mi

Analysis direction volume, Vd 127 veh/h
Opposing direction volume, Vo 196 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.7	1.5
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.799	0.847
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	173 pc/h	252 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.7 mi/h
Adj. for access point density,(note-3) fA 1.0 mi/h

Free-flow speed, FFSd	39.3	mi/h
Adjustment for no-passing zones, fnp	3.3	mi/h
Average travel speed, ATSD	32.7	mi/h
Percent Free Flow Speed, PFFS	83.2	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.965	0.965
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	143 pc/h	221 pc/h
Base percent time-spent-following,(note-4) BPTSFd	16.7	%
Adjustment for no-passing zones, fnp	53.7	
Percent time-spent-following, PTSFd	37.8	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.10
Peak 15-min vehicle-miles of travel, VMT15	35 veh-mi
Peak-hour vehicle-miles of travel, VMT60	127 veh-mi
Peak 15-min total travel time, TT15	1.1 veh-h
Capacity from ATS, CdATS	1440 veh/h
Capacity from PTSF, CdPTSF	1641 veh/h
Directional Capacity	1440 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.7	mi/h
Percent time-spent-following, PTSFd (from above)	37.8	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 138.0
Effective width of outside lane, We 17.06
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 23.38
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 453 (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	36 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	70 %
Up/down	- %	Access point density	16 /mi

Analysis direction volume, Vd 159 veh/h
Opposing direction volume, Vo 190 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.6	1.5
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.822	0.847
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	215 pc/h	249 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 4.0 mi/h

Free-flow speed, FFSd	36.8	mi/h
Adjustment for no-passing zones, fnp	3.2	mi/h
Average travel speed, ATSD	30.0	mi/h
Percent Free Flow Speed, PFFS	81.6	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.965	0.965
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	183 pc/h	219 pc/h
Base percent time-spent-following,(note-4) BPTSFd	20.7	%
Adjustment for no-passing zones, fnp	58.9	
Percent time-spent-following, PTSFd	47.5	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.13
Peak 15-min vehicle-miles of travel, VMT15	44 veh-mi
Peak-hour vehicle-miles of travel, VMT60	159 veh-mi
Peak 15-min total travel time, TT15	1.5 veh-h
Capacity from ATS, CdATS	1440 veh/h
Capacity from PTSF, CdPTSF	1641 veh/h
Directional Capacity	1440 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	30.0	mi/h
Percent time-spent-following, PTSFd (from above)	47.5	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 176.7
Effective width of outside lane, We 15.66
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 23.73
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2010	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	31	vph
Length of first accel/decel lane	465	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	163	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2010	31	163	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v ₁₅	546	9	45	v
Trucks and buses	10	52	24	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.952	0.794	0.893	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	2294	43	203	pcph

Estimation of V₁₂ Diverge Areas

L = (Equation 13-12 or 13-13)

EQ

P = 1.000 Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 2294$ pc/h

12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	2294	4800	No
$v_{12} = v_F - v_R$	2251	4800	No
$v_{12} = v_R$	43	2000	No
v_{12} or v_{12}	0 pc/h	(Equation 13-14 or 13-17)	
3 av ₃₄			
Is v_{12} or v_{12} > 2700 pc/h?		No	
3 av ₃₄			
Is v_{12} or v_{12} > 1.5 v ₁₂ / 2		No	
3 av ₃₄ 12			
If yes, v ₁₂ = 2294	(Equation 13-15, 13-16, 13-18, or 13-19)		
12A			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v ₁₂	2294	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 19.8$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.432$

S

Space mean speed in ramp influence area, $S = 57.9$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 57.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2142	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	135	vph
Length of first accel/decel lane	250	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	519	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	4000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2142	135	519	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v ₁₅	582	38	144	v
Trucks and buses	10	8	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.952	0.962	0.966	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	2445	156	597	pcph

Estimation of V₁₂ Diverge Areas

L = (Equation 13-12 or 13-13)

EQ

P = 0.692 Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 1739$ pc/h

12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
v = v Fi F	2445	7200	No
v = v - v FO F R	2289	7200	No
v R	156	2000	No
v or v 3 av34	706 pc/h	(Equation 13-14 or 13-17)	
Is v or v 3 av34	> 2700 pc/h?		No
Is v or v 3 av34	> 1.5 v /2		No
	12		
If yes, v = 1739 12A	(Equation 13-15, 13-16, 13-18, or 13-19)		

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1739	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 17.0$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.442$

S

Space mean speed in ramp influence area, $S = 57.6$ mph

R

Space mean speed in outer lanes, S = 76.8 mph

0

Space mean speed for all vehicles, S = 62.1 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2526	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	31	vph
Length of first accel/decel lane	1200	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	378	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	3500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2526	31	378	vph
Peak-hour factor, PHF	0.92	0.92	0.92	

Peak 15-min volume, v_{15}	686	8	103	v
Trucks and buses	10	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2883	35	431	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.686$ Using Equation 5

FD

$v_{12} = v_R + (v_F - v_R) P = 1990$ pc/h

$v_{12} = 1990$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_R$	2883	7200	No
$v_{12} = v_F$			
$v_{12} = v_F - v_R$	2848	7200	No
$v_{12} = v_F - v_R$			
$v_{12} = v_F$	35	2000	No
$v_{12} = v_F$			
$v_{12} = v_F$	893 pc/h	(Equation 13-14 or 13-17)	
$v_{12} = v_F$			
Is $v_{12} = v_F > 2700$ pc/h?		No	
$v_{12} = v_F$			
Is $v_{12} = v_F > 1.5 v_{12} / 2$		No	
$v_{12} = v_F$			
If yes, $v_{12} = 1990$		(Equation 13-15, 13-16, 13-18, or 13-19)	
$v_{12} = 1990$			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1990	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 10.6$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.431$

S

Space mean speed in ramp influence area, $S = 57.9$ mph

R

Space mean speed in outer lanes, S = 76.8 mph

0

Space mean speed for all vehicles, S = 62.7 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2873	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	158	vph
Length of first accel/decel lane	180	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	644	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2900	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2873	158	644	vph
Peak-hour factor, PHF	0.92	0.91	0.90	

Peak 15-min volume, v_{15}	781	43	179	v
Trucks and buses	10	19	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.913	0.966	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3279	190	741	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.669$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 2257$ pc/h

$v_{12} = 2257$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	3279	7200	No
$v_{12} = v_F + (v_R - v_F) P$	3089	7200	No
$v_{12} = v_R$	190	2000	No
$v_{12} = v_F$ or $v_{12} = v_R$	1022 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} > 2700$ pc/h?	No		
Is $v_{12} > 1.5 v_F / 2$	No		
If yes, $v_{12} = 2257$	(Equation 13-15, 13-16, 13-18, or 13-19)		

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2257	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 22.0$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.445$

S

Space mean speed in ramp influence area, $S = 57.5$ mph

R

Space mean speed in outer lanes, S = 76.7 mph

0

Space mean speed for all vehicles, S = 62.4 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3490	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	627	vph
Length of first accel/decel lane	850	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	155	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	750	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3490	627	155	vph
Peak-hour factor, PHF	0.93	0.95	0.90	

Peak 15-min volume, v_{15}	938	165	43	v
Trucks and buses	15	6	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.971	0.966	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	4034	680	178	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.628$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 2786$ pc/h

$v_{12} = 2786$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	4034	7200	No
$v_{12} = v_F - v_R$	3354	7200	No
$v_{12} = v_R$	680	2000	No
v_{12} or v_{12}	1248 pc/h	(Equation 13-14 or 13-17)	
v_{12} or v_{12}	> 2700 pc/h?	No	
v_{12} or v_{12}	$> 1.5 v_{12} / 2$	No	
If yes, $v_{12} = 2786$	(Equation 13-15, 13-16, 13-18, or 13-19)		

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2786	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 20.6$ pc/mi/ln

$D = 20.6$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.489$

S

Space mean speed in ramp influence area, $S = 56.3$ mph

R

Space mean speed in outer lanes, S = 75.8 mph

0

Space mean speed for all vehicles, S = 61.2 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3767	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	277	vph
Length of first accel/decel lane	150	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	627	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	920	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3767	277	627	vph
Peak-hour factor, PHF	0.93	0.95	0.95	

Peak 15-min volume, v_{15}	1013	73	165	v
Trucks and buses	15	6	6	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	4354	300	680	pcph

Estimation of V12 Diverge Areas

$$L = 755.98 \text{ (Equation 13-12 or 13-13)}$$

EQ

$$P = 0.637 \text{ Using Equation 5}$$

FD

$$v_{12} = v_F + (v_R - v_F) P = 2884 \text{ pc/h}$$

12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$v = v$ Fi F	4354	7200	No
$v = v - v$ FO F R	4054	7200	No
v R	300	2000	No
v or v 3 av34	1470 pc/h	(Equation 13-14 or 13-17)	
Is v or v 3 av34	> 2700 pc/h?		No
Is v or v 3 av34	> 1.5 $v / 2$		No
If yes, $v = 2884$ 12A	(Equation 13-15, 13-16, 13-18, or 13-19)		

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2884	4400	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L = 27.7 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

$$\text{Intermediate speed variable, } D = 0.455$$

S

$$\text{Space mean speed in ramp influence area, } S = 57.3 \text{ mph}$$

R

Space mean speed in outer lanes, S = 75.0 mph

0

Space mean speed for all vehicles, S = 62.2 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3018	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	124	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane	1500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	94	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3018	124	94	vph
Peak-hour factor, PHF	0.93	0.92	0.92	

Peak 15-min volume, v ₁₅	811	34	26	v
Trucks and buses	15	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.930	0.952	0.952	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	3489	142	107	pcph

Estimation of V₁₂ Diverge Areas

L = (Equation 13-12 or 13-13)

EQ

P = 0.450 Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 1648$ pc/h

12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$v_F = v_{12}$	3489	7200	No
$v_F = v_F - v_R$	3347	7200	No
v_R	142	4000	No
v_3 or v_{av34}	1841 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700$ pc/h?		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		Yes	
If yes, $v_{12A} = 1993$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	1993	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = -19.1$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable, $D = 0.441$

S

Space mean speed in ramp influence area, $S = 57.7$ mph

R

Space mean speed in outer lanes, S = 74.9 mph

0

Space mean speed for all vehicles, S = 64.0 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2701	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	221	vph
Length of first accel/decel lane	650	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	155	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1300	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2701	221	155	vph
Peak-hour factor, PHF	0.93	0.91	0.90	

Peak 15-min volume, v_{15}	726	61	43	v
Trucks and buses	15	7	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.966	0.966	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3122	251	178	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.670$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 2176$ pc/h

$v_{12} = 2176$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	3122	7200	No
$v_{12} = v_F - v_R$	2871	7200	No
$v_{12} = v_F$	251	2000	No
$v_{12} \text{ or } v_{12}$	946 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_{12} > 2700$ pc/h?		No	
Is $v_{12} \text{ or } v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 2176$	(Equation 13-15, 13-16, 13-18, or 13-19)		
$v_{12} = 2176$			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2176	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 17.1$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.451$

S

Space mean speed in ramp influence area, $S = 57.4$ mph

R

Space mean speed in outer lanes, S = 76.8 mph

0

Space mean speed for all vehicles, S = 62.1 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2988	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	287	vph
Length of first accel/decel lane	250	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	221	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	1775	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2988	287	221	vph
Peak-hour factor, PHF	0.93	0.91	0.91	

Peak 15-min volume, v_{15}	803	79	61	v
Trucks and buses	15	7	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.966	0.966	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3454	326	251	pcph

Estimation of V12 Diverge Areas

$$L = 273.18 \text{ (Equation 13-12 or 13-13)}$$

EQ

$$P = 0.659 \text{ Using Equation 5}$$

FD

$$v_{12} = v_F + (v_R - v_F) P = 2386 \text{ pc/h}$$

12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	3454	7200	No
$v_{12} = v_F - v_R$	3128	7200	No
$v_{12} = v_F$	326	2000	No
$v_{12} \text{ or } v_{12}$	1068 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_{12} > 2700 \text{ pc/h?}$		No	
Is $v_{12} \text{ or } v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 2386$	(Equation 13-15, 13-16, 13-18, or 13-19)		
12A			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2386	4400	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L = 22.5 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

$$\text{Intermediate speed variable, } D = 0.457$$

S

$$\text{Space mean speed in ramp influence area, } S = 57.2 \text{ mph}$$

R

Space mean speed in outer lanes, S = 76.5 mph

0

Space mean speed for all vehicles, S = 62.0 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2635	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	166	vph
Length of first accel/decel lane	475	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	57	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2635	166	57	vph
Peak-hour factor, PHF	0.93	0.90	0.90	

Peak 15-min volume, v_{15}	708	46	16	v
Trucks and buses	15	21	24	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.905	0.893	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3046	204	71	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 3046$ pc/h

$v_{12} = 3046$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	3046	4800	No
$v_{12} = v_F - v_R$	2842	4800	No
$v_{12} = v_R$	204	2000	No
$v_{12} \text{ or } v_{12}$	0 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_{12} > 2700$ pc/h?		No	
Is $v_{12} \text{ or } v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 3046$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3046	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 26.2$ pc/mi/ln

$D = 26.2$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.446$

S

Space mean speed in ramp influence area, $S = 57.5$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 57.5 mph

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: West of SC 453
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2010	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	546	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1147	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.2	mi/h
Free-flow speed, FFS	72.2	mi/h

LOS and Performance Measures

Flow rate, vp	1147	pc/h/ln
Free-flow speed, FFS	72.2	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	2	
Density, D	16.4	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Between SC 453 Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1979	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	538	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1129	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.33	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.3	mi/h
Free-flow speed, FFS	74.1	mi/h

LOS and Performance Measures

Flow rate, vp	1129	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	74.8	mi/h
Number of lanes, N	2	
Density, D	15.1	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: SC 453 to SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2142	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	582	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1222	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	1222	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	74.5	mi/h
Number of lanes, N	2	
Density, D	16.4	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Between SC 27 Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2007	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	545	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	764	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, v_p	764	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	10.2	pc/mi/ln
Level of service, LOS	A	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Between SC 27 & Volvo
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2526	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	686	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	961	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, v_p	961	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	12.8	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Between Volvo Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2495	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	678	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	949	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, v_p	949	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	12.7	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Volvo to Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2873	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	781	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1093	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1093	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	74.9	mi/h
Number of lanes, N	3	
Density, D	14.6	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2715	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	738	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1033	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.50	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.8	mi/h
Free-flow speed, FFS	73.6	mi/h

LOS and Performance Measures

Flow rate, vp	1033	pc/h/ln
Free-flow speed, FFS	73.6	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	13.8	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Jedburg to Nexton
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3359	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	913	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1278	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.20	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.8	mi/h
Free-flow speed, FFS	71.6	mi/h

LOS and Performance Measures

Flow rate, vp	1278	pc/h/ln
Free-flow speed, FFS	71.6	mi/h
Average passenger-car speed, S	69.9	mi/h
Number of lanes, N	3	
Density, D	18.3	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Nexton to Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3767	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	1013	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1451	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.33	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	4.1	mi/h
Free-flow speed, FFS	71.3	mi/h

LOS and Performance Measures

Flow rate, vp	1451	pc/h/ln
Free-flow speed, FFS	71.3	mi/h
Average passenger-car speed, S	69.3	mi/h
Number of lanes, N	3	
Density, D	20.9	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2863	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	770	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1103	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1103	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	74.9	mi/h
Number of lanes, N	3	
Density, D	14.7	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3490	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	938	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1345	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1345	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	73.7	mi/h
Number of lanes, N	3	
Density, D	18.3	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Jedburg to Volvo
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3018	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	811	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1163	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	1163	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	74.7	mi/h
Number of lanes, N	3	
Density, D	15.6	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between Volvo Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2894	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	778	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1115	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	1115	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	74.9	mi/h
Number of lanes, N	3	
Density, D	14.9	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between Volvo & SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2988	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	803	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1151	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	1151	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	74.7	mi/h
Number of lanes, N	3	
Density, D	15.4	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between SC 27 Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2480	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	667	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	956	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	956	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	12.7	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between SC 27 Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2701	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	726	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1041	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	1041	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	13.9	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: SC 27 to SC 453
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2635	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	708	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1523	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	1523	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	72.0	mi/h
Number of lanes, N	2	
Density, D	21.2	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between SC 453 Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2469	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	664	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1427	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.33	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.3	mi/h
Free-flow speed, FFS	74.1	mi/h

LOS and Performance Measures

Flow rate, vp	1427	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	73.0	mi/h
Number of lanes, N	2	
Density, D	19.6	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: West of SC 453
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2526	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	679	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1460	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.2	mi/h
Free-flow speed, FFS	72.2	mi/h

LOS and Performance Measures

Flow rate, vp	1460	pc/h/ln
Free-flow speed, FFS	72.2	mi/h
Average passenger-car speed, S	69.2	mi/h
Number of lanes, N	2	
Density, D	21.1	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1979	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	163	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	31	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1979	163	31	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v_{15}	538	45	9	v
Trucks and buses	10	24	52	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.893	0.794	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2259	203	43	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)

EQ

$P = 1.000$ Using Equation 0

FM

$v_{12} = v_{12} (P) = 2259$ pc/h

FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	2462	4800	No
FO			
v_{12} or v_{12}	0 pc/h	(Equation 13-14 or 13-17)	
v_{12} or v_{12}			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
Is v_{12} or v_{12}	> 1.5 $v_{12} / 2$	No	
If yes, v_{12}	= 2259	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2462	4600	No
R12			

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 19.6$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.311$

S

Space mean speed in ramp influence area, $S = 61.3$ mph

R

Space mean speed in outer lanes, $S = N/A$ mph

0

Space mean speed for all vehicles, $S = 61.3$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2007	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	519	vph
Length of first accel/decel lane	900	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	135	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	4000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2007	519	135	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v ₁₅	545	144	38	v
Trucks and buses	10	7	8	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.952	0.966	0.962	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	2291	597	156	pcph

Estimation of V12 Merge Areas

$$L = 445.83 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.603 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 1381 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v	2888	7200	No
FO			
v or v ₃	910 pc/h	(Equation 13-14 or 13-17)	
av ₃₄			
Is v or v ₃	> 2700 pc/h?	No	
av ₃₄			
Is v or v ₃	> 1.5 v ₁₂ / 2	Yes	
av ₃₄	12		
If yes, v _{12A}	= 1381	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v	1978	4600	No
12A			

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_A - 0.00627 L = 15.0 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, M = 0.286

S

Space mean speed in ramp influence area, S = 62.0 mph

R

Space mean speed in outer lanes, S = 68.5 mph

0

Space mean speed for all vehicles, S = 63.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2495	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-flow speed on ramp	35.0	mph
Volume on ramp	378	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane	1500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	31	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	3500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2495	378	31	vph
Peak-hour factor, PHF	0.92	0.92	0.92	

Peak 15-min volume, v_{15}	678	103	8	v
Trucks and buses	10	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2848	431	35	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)

EQ

$P = 0.555$ Using Equation 0

FM

$v_{12} = v_{FM} (P) = 1581$ pc/h

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v	3279	7200	No
FO			
v or v	1267 pc/h	(Equation 13-14 or 13-17)	
3 av34			
Is v or v	> 2700 pc/h?	No	
3 av34			
Is v or v	> 1.5 v /2	Yes	
3 av34	12		
If yes, v	= 1627	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

v_{12A}	Actual 2058	Max Desirable 4600	Violation? No
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Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_{12R} + 0.0078 v_A - 0.00627 L = -6.9$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable, $M = 0.037$

S

Space mean speed in ramp influence area, $S_R = 69.0$ mph

R

Space mean speed in outer lanes, $S_0 = 67.4$ mph

0

Space mean speed for all vehicles, $S = 68.4$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2715	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	644	vph
Length of first accel/decel lane	1120	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	158	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2900	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2715	644	158	vph
Peak-hour factor, PHF	0.92	0.90	0.91	

Peak 15-min volume, v_{15}	738	179	43	v
Trucks and buses	10	7	19	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.966	0.913	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3099	741	190	pcph

Estimation of V12 Merge Areas

$$L = 747.24 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.609 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 1887 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	3840	7200	No
FO			
v_{12} or v_{12}	1212 pc/h	(Equation 13-14 or 13-17)	
3 av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
3 av34			
Is v_{12} or v_{12}	> 1.5 $v_{12} / 2$	Yes	
3 av34	12		
If yes, v_{12}	= 1887	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2628	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 18.6 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.297$

S

Space mean speed in ramp influence area, $S = 61.7 \text{ mph}$

R

Space mean speed in outer lanes, $S = 67.4 \text{ mph}$

0

Space mean speed for all vehicles, $S = 63.4 \text{ mph}$

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2863	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	155	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	627	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	750	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2863	155	627	vph
Peak-hour factor, PHF	0.93	0.90	0.95	

Peak 15-min volume, v_{15}	770	43	165	v
Trucks and buses	15	7	6	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.966	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3309	178	680	pcph

Estimation of V12 Merge Areas

$$L = 840.42 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.614 \text{ Using Equation 2}$$

FM

$$v_{12} = v_{12} (P) = 2031 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	3487	7200	No
FO			
v_{12} or v_{12}	1278 pc/h	(Equation 13-14 or 13-17)	
3 av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
3 av34			
Is v_{12} or v_{12}	> 1.5 $v_{12} / 2$	Yes	
3 av34	12		
If yes, v_{12}	= 2031	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2209	4600	No
12A			

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 13.2 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.252$

S

Space mean speed in ramp influence area, $S = 63.0$ mph

R

Space mean speed in outer lanes, $S = 67.2$ mph

0

Space mean speed for all vehicles, $S = 64.4$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2894	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	94	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	124	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2894	94	124	vph
Peak-hour factor, PHF	0.93	0.92	0.92	

Peak 15-min volume, v ₁₅	778	26	34	v
Trucks and buses	15	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.930	0.952	0.952	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	3345	107	142	pcph

Estimation of V₁₂ Merge Areas

$$L = 832.93 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.619 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 2072 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v	3452	7200	No
FO			
v or v ₃	1273 pc/h	(Equation 13-14 or 13-17)	
av ₃₄			
Is v or v ₃ > 2700 pc/h?		No	
av ₃₄			
Is v or v ₃ > 1.5 v ₁₂ / 2		Yes	
av ₃₄ 12			
If yes, v _{12A} = 2072		(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v	2179	4600	No
12A			

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_R + 0.0078 v_A - 0.00627 L = 13.0 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, M = 0.250

S

Space mean speed in ramp influence area, S = 63.0 mph

R

Space mean speed in outer lanes, S = 67.2 mph

0

Space mean speed for all vehicles, S = 64.5 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2480	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	155	vph
Length of first accel/decel lane	900	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	221	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1300	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2480	155	221	vph
Peak-hour factor, PHF	0.93	0.90	0.91	

Peak 15-min volume, v_{15}	667	43	61	v
Trucks and buses	15	7	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.966	0.966	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2867	178	251	pcph

Estimation of V12 Merge Areas

$$L = 479.43 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.603 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 1728 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	3045	7200	No
FO			
v_{12} or v_{12}	1139 pc/h	(Equation 13-14 or 13-17)	
3 av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
3 av34			
Is v_{12} or v_{12}	> 1.5 $v_{12} / 2$	Yes	
3 av34	12		
If yes, v_{12}	= 1728	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	1906	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 14.6 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.284$

S

Space mean speed in ramp influence area, $S = 62.0$ mph

R

Space mean speed in outer lanes, $S = 67.7$ mph

0

Space mean speed for all vehicles, $S = 64.0$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2469	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	57	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	166	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2469	57	166	vph
Peak-hour factor, PHF	0.93	0.90	0.90	

Peak 15-min volume, v_{15}	664	16	46	v
Trucks and buses	15	24	21	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.893	0.905	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2854	71	204	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)

EQ

$P = 1.000$ Using Equation 0

FM

$v_{12} = v_{15} (P_{FM}) = 2854$ pc/h

12 F FM

Capacity Checks

v_{12}	Actual 2925	Maximum 4800	LOS F? No
FO			
v_{12} or v_{15}	0 pc/h	(Equation 13-14 or 13-17)	
3 av34			
Is v_{12} or $v_{15} > 2700$ pc/h?		No	
3 av34			
Is v_{12} or $v_{15} > 1.5 v_{12} / 2$		No	
3 av34 12			
If yes, $v_{12} = 2854$	(Equation 13-15, 13-16, 13-18, or 13-19)		
12A			

Flow Entering Merge Influence Area

v_{12}	Actual 2925	Max Desirable 4600	Violation? No
R12			

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_{12} + 0.0078 v_{15} - 0.00627 L = 23.2$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $M = 0.338$

S

Space mean speed in ramp influence area, $S = 60.5$ mph

R

Space mean speed in outer lanes, $S = N/A$ mph

0

Space mean speed for all vehicles, $S = 60.5$ mph

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Jedburg Road (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.95
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 561 veh/h
Opposing direction volume, Vo 407 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.3
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.993	0.979
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	595 pc/h	438 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	2.5	mi/h
Average travel speed, ATSD	33.0	mi/h
Percent Free Flow Speed, PFFS	75.8	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	591 pc/h	428 pc/h
Base percent time-spent-following,(note-4) BPTSFd	56.4	%
Adjustment for no-passing zones, fnp	37.0	
Percent time-spent-following, PTSFd	77.9	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.35
Peak 15-min vehicle-miles of travel, VMT15	148 veh-mi
Peak-hour vehicle-miles of travel, VMT60	561 veh-mi
Peak 15-min total travel time, TT15	4.5 veh-h
Capacity from ATS, CdATS	1664 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1664 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	33.0	mi/h
Percent time-spent-following, PTSFd (from above)	77.9	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 590.5
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.95
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Jedburg Road (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	60 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 686 veh/h
Opposing direction volume, Vo 836 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.993	1.000
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	751 pc/h	909 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	0.7	mi/h
Average travel speed, ATSD	29.9	mi/h
Percent Free Flow Speed, PFFS	68.8	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	746 pc/h	909 pc/h
Base percent time-spent-following,(note-4) BPTSFd	68.2	%
Adjustment for no-passing zones, fnp	21.9	
Percent time-spent-following, PTSFd	78.1	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.44
Peak 15-min vehicle-miles of travel, VMT15	186 veh-mi
Peak-hour vehicle-miles of travel, VMT60	686 veh-mi
Peak 15-min total travel time, TT15	6.2 veh-h
Capacity from ATS, CdATS	1700 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1700 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	29.9	mi/h
Percent time-spent-following, PTSFd (from above)	78.1	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 745.7
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 6.07
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Volvo Car Drive (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	6.0 ft	% Trucks and buses	10 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	20 %
Up/down	- %	Access point density	8 /mi

Analysis direction volume, Vd 155 veh/h
Opposing direction volume, Vo 472 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.6	1.2
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.943	0.980
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	179 pc/h	524 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 0.0 mi/h
Adj. for access point density,(note-3) fA 2.0 mi/h

Free-flow speed, FFSd	48.0	mi/h
Adjustment for no-passing zones, fnp	0.7	mi/h
Average travel speed, ATSD	41.8	mi/h
Percent Free Flow Speed, PFFS	87.2	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.990	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	170 pc/h	513 pc/h
Base percent time-spent-following,(note-4) BPTSFd	24.0	%
Adjustment for no-passing zones, fnp	24.8	
Percent time-spent-following, PTSFd	30.2	%

Level of Service and Other Performance Measures

Level of service, LOS	B
Volume to capacity ratio, v/c	0.11
Peak 15-min vehicle-miles of travel, VMT15	42 veh-mi
Peak-hour vehicle-miles of travel, VMT60	155 veh-mi
Peak 15-min total travel time, TT15	1.0 veh-h
Capacity from ATS, CdATS	1666 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1666 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	41.8	mi/h
Percent time-spent-following, PTSFd (from above)	30.2	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 168.5
Effective width of outside lane, We 28.05
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 3.48
Bicycle LOS C

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 27 (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	7 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	30 /mi

Analysis direction volume, Vd 452 veh/h
Opposing direction volume, Vo 581 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.2	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.986	0.993
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	509 pc/h	650 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 7.5 mi/h

Free-flow speed, FFSd	43.3	mi/h
Adjustment for no-passing zones, fnp	1.6	mi/h
Average travel speed, ATSD	32.7	mi/h
Percent Free Flow Speed, PFFS	75.4	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	502 pc/h	646 pc/h
Base percent time-spent-following,(note-4) BPTSFd	53.3	%
Adjustment for no-passing zones, fnp	34.3	
Percent time-spent-following, PTSFd	68.3	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.30
Peak 15-min vehicle-miles of travel, VMT15	126 veh-mi
Peak-hour vehicle-miles of travel, VMT60	452 veh-mi
Peak 15-min total travel time, TT15	3.9 veh-h
Capacity from ATS, CdATS	1688 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1688 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.7	mi/h
Percent time-spent-following, PTSFd (from above)	68.3	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 502.2
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 6.01
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 27 (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	10 /mi

Analysis direction volume, Vd 414 veh/h
Opposing direction volume, Vo 504 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.2	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.986	0.993
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	467 pc/h	564 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 2.5 mi/h

Free-flow speed, FFSd	49.5	mi/h
Adjustment for no-passing zones, fnp	2.0	mi/h
Average travel speed, ATSD	39.5	mi/h
Percent Free Flow Speed, PFFS	79.7	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	460 pc/h	560 pc/h
Base percent time-spent-following,(note-4) BPTSFd	49.7	%
Adjustment for no-passing zones, fnp	38.1	
Percent time-spent-following, PTSFd	66.9	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.27
Peak 15-min vehicle-miles of travel, VMT15	115 veh-mi
Peak-hour vehicle-miles of travel, VMT60	414 veh-mi
Peak 15-min total travel time, TT15	2.9 veh-h
Capacity from ATS, CdATS	1688 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1688 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	39.5	mi/h
Percent time-spent-following, PTSFd (from above)	66.9	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 460.0
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.83
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
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Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 453 (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	24 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	75 %
Up/down	- %	Access point density	4 /mi

Analysis direction volume, Vd 156 veh/h
Opposing direction volume, Vo 180 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.6	1.5
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.874	0.893
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	198 pc/h	224 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.7 mi/h
Adj. for access point density,(note-3) fA 1.0 mi/h

Free-flow speed, FFSd	39.3	mi/h
Adjustment for no-passing zones, fnp	3.5	mi/h
Average travel speed, ATSD	32.6	mi/h
Percent Free Flow Speed, PFFS	82.8	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.977	0.977
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	177 pc/h	205 pc/h
Base percent time-spent-following,(note-4) BPTSFd	19.3	%
Adjustment for no-passing zones, fnp	59.3	
Percent time-spent-following, PTSFd	46.8	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.12
Peak 15-min vehicle-miles of travel, VMT15	43 veh-mi
Peak-hour vehicle-miles of travel, VMT60	156 veh-mi
Peak 15-min total travel time, TT15	1.3 veh-h
Capacity from ATS, CdATS	1518 veh/h
Capacity from PTSF, CdPTSF	1660 veh/h
Directional Capacity	1518 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.6	mi/h
Percent time-spent-following, PTSFd (from above)	46.8	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 173.3
Effective width of outside lane, We 15.25
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 13.97
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 453 (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	24 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	70 %
Up/down	- %	Access point density	16 /mi

Analysis direction volume, Vd 170 veh/h
Opposing direction volume, Vo 243 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.5	1.4
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.893	0.912
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	212 pc/h	296 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 4.0 mi/h

Free-flow speed, FFSd	36.8	mi/h
Adjustment for no-passing zones, fnp	2.9	mi/h
Average travel speed, ATSD	30.0	mi/h
Percent Free Flow Speed, PFFS	81.5	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.977	0.977
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	193 pc/h	276 pc/h
Base percent time-spent-following,(note-4) BPTSFd	22.7	%
Adjustment for no-passing zones, fnp	54.2	
Percent time-spent-following, PTSFd	45.0	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.12
Peak 15-min vehicle-miles of travel, VMT15	47 veh-mi
Peak-hour vehicle-miles of travel, VMT60	170 veh-mi
Peak 15-min total travel time, TT15	1.6 veh-h
Capacity from ATS, CdATS	1550 veh/h
Capacity from PTSF, CdPTSF	1660 veh/h
Directional Capacity	1550 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	30.0	mi/h
Percent time-spent-following, PTSFd (from above)	45.0	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 188.9
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 14.33
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Jedburg Road (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.95
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 407 veh/h
Opposing direction volume, Vo 561 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.3	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.979	0.993
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	438 pc/h	595 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	1.8	mi/h
Average travel speed, ATSD	33.7	mi/h
Percent Free Flow Speed, PFFS	77.4	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	428 pc/h	591 pc/h
Base percent time-spent-following,(note-4) BPTSFd	47.8	%
Adjustment for no-passing zones, fnp	37.0	
Percent time-spent-following, PTSFd	63.3	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.26
Peak 15-min vehicle-miles of travel, VMT15	107 veh-mi
Peak-hour vehicle-miles of travel, VMT60	407 veh-mi
Peak 15-min total travel time, TT15	3.2 veh-h
Capacity from ATS, CdATS	1688 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1688 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	33.7	mi/h
Percent time-spent-following, PTSFd (from above)	63.3	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 428.4
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.79
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Jedburg Road (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	60 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 836 veh/h
Opposing direction volume, Vo 686 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	1.000	0.993
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	909 pc/h	751 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	0.9	mi/h
Average travel speed, ATSD	29.7	mi/h
Percent Free Flow Speed, PFFS	68.3	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	909 pc/h	746 pc/h
Base percent time-spent-following,(note-4) BPTSFd	73.0	%
Adjustment for no-passing zones, fnp	21.9	
Percent time-spent-following, PTSFd	85.0	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.53
Peak 15-min vehicle-miles of travel, VMT15	227 veh-mi
Peak-hour vehicle-miles of travel, VMT60	836 veh-mi
Peak 15-min total travel time, TT15	7.6 veh-h
Capacity from ATS, CdATS	1688 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1688 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	29.7	mi/h
Percent time-spent-following, PTSFd (from above)	85.0	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 908.7
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 6.17
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Volvo Car Drive (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	6.0 ft	% Trucks and buses	10 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	20 %
Up/down	- %	Access point density	8 /mi

Analysis direction volume, Vd 472 veh/h
Opposing direction volume, Vo 155 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.2	1.6
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.980	0.943
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	524 pc/h	179 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 0.0 mi/h
Adj. for access point density,(note-3) fA 2.0 mi/h

Free-flow speed, FFSd	48.0	mi/h
Adjustment for no-passing zones, fnp	0.9	mi/h
Average travel speed, ATSD	41.7	mi/h
Percent Free Flow Speed, PFFS	86.8	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	0.990
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	513 pc/h	170 pc/h
Base percent time-spent-following,(note-4) BPTSFd	45.5	%
Adjustment for no-passing zones, fnp	24.8	
Percent time-spent-following, PTSFd	64.1	%

Level of Service and Other Performance Measures

Level of service, LOS	B
Volume to capacity ratio, v/c	0.31
Peak 15-min vehicle-miles of travel, VMT15	128 veh-mi
Peak-hour vehicle-miles of travel, VMT60	472 veh-mi
Peak 15-min total travel time, TT15	3.1 veh-h
Capacity from ATS, CdATS	1603 veh/h
Capacity from PTSF, CdPTSF	1683 veh/h
Directional Capacity	1603 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	41.7	mi/h
Percent time-spent-following, PTSFd (from above)	64.1	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 513.0
Effective width of outside lane, We 24.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.10
Bicycle LOS E

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 27 (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	7 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	30 /mi

Analysis direction volume, Vd 581 veh/h
Opposing direction volume, Vo 452 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.2
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.993	0.986
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	650 pc/h	509 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 7.5 mi/h

Free-flow speed, FFSd	43.3	mi/h
Adjustment for no-passing zones, fnp	2.2	mi/h
Average travel speed, ATSD	32.1	mi/h
Percent Free Flow Speed, PFFS	74.1	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	646 pc/h	502 pc/h
Base percent time-spent-following,(note-4) BPTSFd	60.3	%
Adjustment for no-passing zones, fnp	34.3	
Percent time-spent-following, PTSFd	79.6	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.38
Peak 15-min vehicle-miles of travel, VMT15	161 veh-mi
Peak-hour vehicle-miles of travel, VMT60	581 veh-mi
Peak 15-min total travel time, TT15	5.0 veh-h
Capacity from ATS, CdATS	1676 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1676 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.1	mi/h
Percent time-spent-following, PTSFd (from above)	79.6	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 645.6
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 6.13
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 27 (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	10 /mi

Analysis direction volume, Vd 504 veh/h
Opposing direction volume, Vo 414 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.2
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.993	0.986
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	564 pc/h	467 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 2.5 mi/h

Free-flow speed, FFSd	49.5	mi/h
Adjustment for no-passing zones, fnp	2.4	mi/h
Average travel speed, ATSD	39.1	mi/h
Percent Free Flow Speed, PFFS	78.9	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	560 pc/h	460 pc/h
Base percent time-spent-following,(note-4) BPTSFd	54.0	%
Adjustment for no-passing zones, fnp	38.1	
Percent time-spent-following, PTSFd	74.9	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.33
Peak 15-min vehicle-miles of travel, VMT15	140 veh-mi
Peak-hour vehicle-miles of travel, VMT60	504 veh-mi
Peak 15-min total travel time, TT15	3.6 veh-h
Capacity from ATS, CdATS	1676 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1676 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	39.1	mi/h
Percent time-spent-following, PTSFd (from above)	74.9	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 560.0
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.93
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 453 (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	24 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	75 %
Up/down	- %	Access point density	4 /mi

Analysis direction volume, Vd 180 veh/h
Opposing direction volume, Vo 156 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.5	1.6
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.893	0.874
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	224 pc/h	198 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.7 mi/h
Adj. for access point density,(note-3) fA 1.0 mi/h

Free-flow speed, FFSd	39.3	mi/h
Adjustment for no-passing zones, fnp	3.6	mi/h
Average travel speed, ATSD	32.4	mi/h
Percent Free Flow Speed, PFFS	82.5	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.977	0.977
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	205 pc/h	177 pc/h
Base percent time-spent-following,(note-4) BPTSFd	22.0	%
Adjustment for no-passing zones, fnp	59.3	
Percent time-spent-following, PTSFd	53.8	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.13
Peak 15-min vehicle-miles of travel, VMT15	50 veh-mi
Peak-hour vehicle-miles of travel, VMT60	180 veh-mi
Peak 15-min total travel time, TT15	1.5 veh-h
Capacity from ATS, CdATS	1486 veh/h
Capacity from PTSF, CdPTSF	1660 veh/h
Directional Capacity	1486 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.4	mi/h
Percent time-spent-following, PTSFd (from above)	53.8	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 200.0
Effective width of outside lane, We 12.50
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 14.42
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 453 (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	24 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	70 %
Up/down	- %	Access point density	16 /mi

Analysis direction volume, Vd 243 veh/h
Opposing direction volume, Vo 170 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.4	1.5
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.912	0.893
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	296 pc/h	212 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 4.0 mi/h

Free-flow speed, FFSd	36.8	mi/h
Adjustment for no-passing zones, fnp	3.4	mi/h
Average travel speed, ATSD	29.5	mi/h
Percent Free Flow Speed, PFFS	80.1	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.977	0.977
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	276 pc/h	193 pc/h
Base percent time-spent-following,(note-4) BPTSFd	28.3	%
Adjustment for no-passing zones, fnp	54.2	
Percent time-spent-following, PTSFd	60.2	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.17
Peak 15-min vehicle-miles of travel, VMT15	68 veh-mi
Peak-hour vehicle-miles of travel, VMT60	243 veh-mi
Peak 15-min total travel time, TT15	2.3 veh-h
Capacity from ATS, CdATS	1518 veh/h
Capacity from PTSF, CdPTSF	1660 veh/h
Directional Capacity	1518 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	29.5	mi/h
Percent time-spent-following, PTSFd (from above)	60.2	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 270.0
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 14.51
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

June 2019

C.9 2043 BUILD – ALTERNATIVE 3



HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1978	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	67	vph
Length of first accel/decel lane	465	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	171	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1978	67	171	vph
Peak-hour factor, PHF	0.91	0.95	0.90	

Peak 15-min volume, v ₁₅	543	18	48	v
Trucks and buses	24	53	36	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.893	0.791	0.847	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	2434	89	224	pcph

Estimation of V12 Diverge Areas

L = (Equation 13-12 or 13-13)

EQ

P = 1.000 Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 2434$ pc/h

12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	2434	4800	No
$v_{12} = v_F + (v_R - v_F) P$	2345	4800	No
$v_{12} = v_F + (v_R - v_F) P$	89	2000	No
$v_{12} = v_F + (v_R - v_F) P$	0 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} > 2700$ pc/h?		No	
Is $v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 2434$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2434	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 21.0$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.436$

S

Space mean speed in ramp influence area, $S = 57.8$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 57.8 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2082	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	156	vph
Length of first accel/decel lane	250	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	670	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	4000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2082	156	670	vph
Peak-hour factor, PHF	0.91	0.90	0.90	

Peak 15-min volume, v_{15}	572	43	186	v
Trucks and buses	24	23	16	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.897	0.926	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2562	193	804	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.687$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 1821$ pc/h

$v_{12} = 1821$

Capacity Checks

	Actual	Maximum	LOS F?
v = v Fi F	2562	7200	No
v = v - v FO F R	2369	7200	No
v R	193	2000	No
v or v 3 av34	741 pc/h	(Equation 13-14 or 13-17)	
Is v or v 3 av34	> 2700 pc/h?	No	
Is v or v 3 av34	> 1.5 v /2	No	
	12		
If yes, v = 1821 12A		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1821	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 17.7$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.445$

S

Space mean speed in ramp influence area, $S = 57.5$ mph

R

Space mean speed in outer lanes, S = 76.8 mph

0

Space mean speed for all vehicles, S = 62.0 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2596	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	186	vph
Length of first accel/decel lane	1200	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	500	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	3500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2596	186	500	vph
Peak-hour factor, PHF	0.91	0.92	0.92	

Peak 15-min volume, v_{15}	713	51	136	v
Trucks and buses	24	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3195	212	571	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.670$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 2212$ pc/h

$v_{12} = 2212$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	3195	7200	No
$v_{12} = v_F - v_R$	2983	7200	No
$v_{12} = v_R$	212	2000	No
v_{12} or v_{12}	983 pc/h	(Equation 13-14 or 13-17)	
Is v_{12} or $v_{12} > 2700$ pc/h?		No	
Is v_{12} or $v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 2212$	(Equation 13-15, 13-16, 13-18, or 13-19)		

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2212	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 12.5$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.447$

S

Space mean speed in ramp influence area, $S = 57.5$ mph

R

Space mean speed in outer lanes, S = 76.8 mph

0

Space mean speed for all vehicles, S = 62.3 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2910	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	185	vph
Length of first accel/decel lane	180	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1105	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2900	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2910	185	1105	vph
Peak-hour factor, PHF	0.91	0.90	0.90	

Peak 15-min volume, v_{15}	799	51	307	v
Trucks and buses	24	29	11	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.873	0.948	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3582	235	1295	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.660$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 2443$ pc/h

$v_{12} = 2443$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	3582	7200	No
$v_{12} = v_F - v_R$	3347	7200	No
$v_{12} = v_R$	235	2000	No
v_{12} or v_{12}	1139 pc/h	(Equation 13-14 or 13-17)	
Is v_{12} or $v_{12} > 2700$ pc/h?		No	
Is v_{12} or $v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 2443$	(Equation 13-15, 13-16, 13-18, or 13-19)		
$v_{12} = 2443$			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2443	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 23.6$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.449$

S

Space mean speed in ramp influence area, $S = 57.4$ mph

R

Space mean speed in outer lanes, S = 76.2 mph

0

Space mean speed for all vehicles, S = 62.3 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3726	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	404	vph
Length of first accel/decel lane	850	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	193	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	750	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3726	404	193	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v_{15}	1012	112	54	v
Trucks and buses	22	10	11	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.952	0.948	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	4495	471	226	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.626$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 2990$ pc/h

$v_{12} = 2990$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	4495	7200	No
$v_{12} = v_F - v_R$	4024	7200	No
$v_{12} = v_R$	471	2000	No
$v_{12} = v_F$ or $v_{12} = v_R$	1505 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} > 2700$ pc/h?	No		
Is $v_{12} > 1.5 v_{12} / 2$	No		
If yes, $v_{12} = 2990$	(Equation 13-15, 13-16, 13-18, or 13-19)		

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2990	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 22.3$ pc/mi/ln

$D = 22.3$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.470$

S

Space mean speed in ramp influence area, $S = 56.8$ mph

R

Space mean speed in outer lanes, S = 74.8 mph

0

Space mean speed for all vehicles, S = 61.8 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3920	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	194	vph
Length of first accel/decel lane	150	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	404	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	920	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3920	194	404	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v_{15}	1065	54	112	v
Trucks and buses	22	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	4730	226	471	pcph

Estimation of V12 Diverge Areas

$$L = 514.91 \text{ (Equation 13-12 or 13-13)}$$

EQ

$$P = 0.631 \text{ Using Equation 5}$$

FD

$$v_{12} = v_F + (v_R - v_F) P = 3070 \text{ pc/h}$$

$$v_{12} = v_F + (v_R - v_F) P = 3070 \text{ pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	4730	7200	No
$v_{12} = v_F - v_R$	4504	7200	No
$v_{12} = v_F - v_R$	226	2000	No
$v_{12} = v_F$	1660 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} > 2700 \text{ pc/h}$?	No		
Is $v_{12} > 1.5 v_{12} / 2$?	No		
If yes, $v_{12} = 3070$	(Equation 13-15, 13-16, 13-18, or 13-19)		

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3070	4400	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L = 29.3 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

$$\text{Intermediate speed variable, } D = 0.448$$

S

$$\text{Space mean speed in ramp influence area, } S = 57.4 \text{ mph}$$

R

Space mean speed in outer lanes, S = 74.2 mph

0

Space mean speed for all vehicles, S = 62.4 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3515	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	743	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane	1500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	125	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3515	743	125	vph
Peak-hour factor, PHF	0.92	0.92	0.92	

Peak 15-min volume, v_{15}	955	202	34	v
Trucks and buses	22	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	4241	848	143	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.450$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 2375$ pc/h

$12 \quad R \quad F \quad R \quad FD$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	4241	7200	No
$F_i \quad F$			
$v_{12} = v_F - v_R$	3393	7200	No
$FO \quad F \quad R$			
v_R	848	4000	No
R			
v_{12} or v_{12}	1866 pc/h	(Equation 13-14 or 13-17)	
$3 \quad av_{34}$			
Is v_{12} or $v_{12} > 2700$ pc/h?		No	
$3 \quad av_{34}$			
Is v_{12} or $v_{12} > 1.5 v_{12} / 2$		Yes	
$3 \quad av_{34} \quad 12$			
If yes, $v_{12} = 2423$		(Equation 13-15, 13-16, 13-18, or 13-19)	
$12A$			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2423	4400	No
$12A$			

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = -15.4$ pc/mi/ln

$R \quad 12 \quad D$

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable, $D = 0.504$

S

Space mean speed in ramp influence area, $S = 55.9$ mph

R

Space mean speed in outer lanes, S = 73.6 mph

0

Space mean speed for all vehicles, S = 62.3 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2630	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	230	vph
Length of first accel/decel lane	650	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	154	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1300	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2630	230	154	vph
Peak-hour factor, PHF	0.92	0.94	0.90	

Peak 15-min volume, v_{15}	715	61	43	v
Trucks and buses	22	25	16	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.889	0.926	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3173	275	185	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.668$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 2211$ pc/h

$v_{12} = 2211$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	3173	7200	No
$v_{12} = v_F - v_R$	2898	7200	No
$v_{12} = v_R$	275	2000	No
$v_{12} \text{ or } v_{12}$	962 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_{12} > 2700$ pc/h?		No	
Is $v_{12} \text{ or } v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 2211$	(Equation 13-15, 13-16, 13-18, or 13-19)		

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2211	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 17.4$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.453$

S

Space mean speed in ramp influence area, $S = 57.3$ mph

R

Space mean speed in outer lanes, S = 76.8 mph

0

Space mean speed for all vehicles, S = 62.1 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2897	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	267	vph
Length of first accel/decel lane	250	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	230	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	1775	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2897	267	230	vph
Peak-hour factor, PHF	0.92	0.94	0.94	

Peak 15-min volume, v_{15}	787	71	61	v
Trucks and buses	22	25	25	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.889	0.889	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3495	320	275	pcph

Estimation of V12 Diverge Areas

$$L = 299.01 \text{ (Equation 13-12 or 13-13)}$$

EQ

$$P = 0.658 \text{ Using Equation 5}$$

FD

$$v_{12} = v_F + (v_R - v_F) P = 2409 \text{ pc/h}$$

$$v_{12} = v_F + (v_R - v_F) P = 2409 \text{ pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	3495	7200	No
$v_{12} = v_F + (v_R - v_F) P$	3175	7200	No
$v_{12} = v_F + (v_R - v_F) P$	320	2000	No
$v_{12} = v_F + (v_R - v_F) P$	1086 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} > 2700 \text{ pc/h}$?	No		
Is $v_{12} > 1.5 v_F / 2$?	No		
If yes, $v_{12} = 2409$	(Equation 13-15, 13-16, 13-18, or 13-19)		

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2409	4400	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L = 22.7 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

$$\text{Intermediate speed variable, } D = 0.457$$

S

$$\text{Space mean speed in ramp influence area, } S = 57.2 \text{ mph}$$

R

Space mean speed in outer lanes, S = 76.5 mph

0

Space mean speed for all vehicles, S = 62.1 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2554	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	192	vph
Length of first accel/decel lane	475	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	66	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2554	192	66	vph
Peak-hour factor, PHF	0.92	0.90	0.92	

Peak 15-min volume, v ₁₅	694	53	18	v
Trucks and buses	22	46	36	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.901	0.813	0.847	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	3081	262	85	pcph

Estimation of V12 Diverge Areas

L = (Equation 13-12 or 13-13)

EQ

P = 1.000 Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 3081$ pc/h

12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
v = v Fi F	3081	4800	No
v = v - v FO F R	2819	4800	No
v R	262	2000	No
v or v 3 av34	0 pc/h	(Equation 13-14 or 13-17)	
Is v or v 3 av34	> 2700 pc/h?	No	
Is v or v 3 av34	> 1.5 v /2	No	
	12		
If yes, v = 3081 12A		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3081	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 26.5$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.452$

S

Space mean speed in ramp influence area, $S = 57.4$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 57.4 mph

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: West of SC 453
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1978	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	543	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	1217	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.2	mi/h
Free-flow speed, FFS	72.2	mi/h

LOS and Performance Measures

Flow rate, vp	1217	pc/h/ln
Free-flow speed, FFS	72.2	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	2	
Density, D	17.4	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Between SC 453 Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1911	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	525	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	1176	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.33	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.3	mi/h
Free-flow speed, FFS	74.1	mi/h

LOS and Performance Measures

Flow rate, vp	1176	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	74.7	mi/h
Number of lanes, N	2	
Density, D	15.8	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: SC 453 to SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2082	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	572	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	1281	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	1281	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	74.1	mi/h
Number of lanes, N	2	
Density, D	17.3	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Between SC 27 Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1926	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	529	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	790	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	790	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	10.5	pc/mi/ln
Level of service, LOS	A	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Between SC 27 & Volvo
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2596	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	713	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	1065	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1065	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	14.2	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Between Volvo Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2410	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	662	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	989	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	989	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	13.2	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Volvo to Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2910	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	799	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	1194	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1194	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	74.6	mi/h
Number of lanes, N	3	
Density, D	16.0	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2725	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	749	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	1118	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.50	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.8	mi/h
Free-flow speed, FFS	73.6	mi/h

LOS and Performance Measures

Flow rate, v_p	1118	pc/h/ln
Free-flow speed, FFS	73.6	mi/h
Average passenger-car speed, S	74.8	mi/h
Number of lanes, N	3	
Density, D	14.9	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Jedburg to Nexton
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3830	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	1052	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	1571	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.20	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.8	mi/h
Free-flow speed, FFS	71.6	mi/h

LOS and Performance Measures

Flow rate, vp	1571	pc/h/ln
Free-flow speed, FFS	71.6	mi/h
Average passenger-car speed, S	68.4	mi/h
Number of lanes, N	3	
Density, D	23.0	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
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Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Nexton to Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3920	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1065	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1577	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.33	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	4.1	mi/h
Free-flow speed, FFS	71.3	mi/h

LOS and Performance Measures

Flow rate, vp	1577	pc/h/ln
Free-flow speed, FFS	71.3	mi/h
Average passenger-car speed, S	68.4	mi/h
Number of lanes, N	3	
Density, D	23.1	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
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Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3322	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	903	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1336	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1336	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	73.8	mi/h
Number of lanes, N	3	
Density, D	18.1	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3726	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1012	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1498	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1498	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	72.3	mi/h
Number of lanes, N	3	
Density, D	20.7	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Jedburg to Volvo
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3515	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	955	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1414	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	1414	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	73.1	mi/h
Number of lanes, N	3	
Density, D	19.3	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between Volvo Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2772	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	753	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1115	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	1115	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	74.9	mi/h
Number of lanes, N	3	
Density, D	14.9	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
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Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between Volvo & SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2897	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	787	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1165	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	1165	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	74.7	mi/h
Number of lanes, N	3	
Density, D	15.6	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between SC 27 Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2400	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	652	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	965	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, v_p	965	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	12.9	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
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Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between SC 27 Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2630	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	715	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1058	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	1058	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	14.1	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: SC 27 to SC 453
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2554	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	694	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1541	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	1541	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	71.8	mi/h
Number of lanes, N	2	
Density, D	21.5	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between SC 453 Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2362	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	642	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1425	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.33	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.3	mi/h
Free-flow speed, FFS	74.1	mi/h

LOS and Performance Measures

Flow rate, vp	1425	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	73.0	mi/h
Number of lanes, N	2	
Density, D	19.5	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: West of SC 453
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2428	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	660	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1465	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.2	mi/h
Free-flow speed, FFS	72.2	mi/h

LOS and Performance Measures

Flow rate, vp	1465	pc/h/ln
Free-flow speed, FFS	72.2	mi/h
Average passenger-car speed, S	69.2	mi/h
Number of lanes, N	2	
Density, D	21.2	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1911	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	171	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	67	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1911	171	67	vph
Peak-hour factor, PHF	0.91	0.90	0.95	

Peak 15-min volume, v_{15}	525	48	18	v
Trucks and buses	24	36	53	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.847	0.791	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2352	224	89	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)

EQ

$P = 1.000$ Using Equation 0

FM

$v_{12} = v_{12} (P) = 2352$ pc/h

FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	2576	4800	No
FO			
v_{12} or v_{12}	0 pc/h	(Equation 13-14 or 13-17)	
$\frac{v_{12}}{3}$ av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
$\frac{v_{12}}{3}$ av34			
Is v_{12} or v_{12}	$> 1.5 \frac{v_{12}}{12}$	No	
$\frac{v_{12}}{3}$ av34			
If yes, v_{12}	$= 2352$	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2576	4600	No
R12			

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 \frac{v_{12}}{R} + 0.0078 \frac{v_{12}}{A} - 0.00627 L = 20.4$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $M = 0.316$

S

Space mean speed in ramp influence area, $S = 61.1$ mph

R

Space mean speed in outer lanes, $S = N/A$ mph

0

Space mean speed for all vehicles, $S = 61.1$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1926	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	670	vph
Length of first accel/decel lane	900	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	156	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	4000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1926	670	156	vph
Peak-hour factor, PHF	0.91	0.90	0.90	

Peak 15-min volume, v_{15}	529	186	43	v
Trucks and buses	24	16	23	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.926	0.897	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2370	804	193	pcph

Estimation of V12 Merge Areas

$$L = 507.04 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.603 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 1428 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	3174	7200	No
FO			
v_{12} or v_{12}	942 pc/h	(Equation 13-14 or 13-17)	
3 av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
3 av34			
Is v_{12} or v_{12}	> 1.5 $v_{12} / 2$	Yes	
3 av34	12		
If yes, v_{12}	= 1428	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2232	4600	No
12A			

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 16.9 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.294$

S

Space mean speed in ramp influence area, $S = 61.8 \text{ mph}$

R

Space mean speed in outer lanes, $S = 68.4 \text{ mph}$

0

Space mean speed for all vehicles, $S = 63.6 \text{ mph}$

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2410	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-flow speed on ramp	35.0	mph
Volume on ramp	500	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane	1500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	186	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	3500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2410	500	186	vph
Peak-hour factor, PHF	0.91	0.92	0.92	

Peak 15-min volume, v_{15}	662	136	51	v
Trucks and buses	24	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2966	571	212	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)

EQ

$P = 0.555$ Using Equation 0

FM

$v_{12} = v_{12} (P) = 1646$ pc/h

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	3537	7200	No
FO			
v_{12} or v_{12}	1320 pc/h	(Equation 13-14 or 13-17)	
3 av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
3 av34			
Is v_{12} or v_{12}	> 1.5 $v_{12} / 2$	Yes	
3 av34	12		
If yes, v_{12}	= 1694	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2265	4600	No
12A			

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = -5.3$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable, $M = 0.044$

S

Space mean speed in ramp influence area, $S = 68.8$ mph

R

Space mean speed in outer lanes, $S = 67.2$ mph

0

Space mean speed for all vehicles, $S = 68.2$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2725	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	1105	vph
Length of first accel/decel lane	1120	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	185	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1900	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2725	1105	185	vph
Peak-hour factor, PHF	0.91	0.90	0.90	

Peak 15-min volume, v ₁₅	749	307	51	v
Trucks and buses	24	11	29	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.893	0.948	0.873	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	3354	1295	235	pcph

Estimation of V₁₂ Merge Areas

$$L = 920.37 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.609 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 2042 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v	4649	7200	No
FO			
v or v ₃	1312 pc/h	(Equation 13-14 or 13-17)	
av ₃₄			
Is v or v ₃ > 2700 pc/h?		No	
av ₃₄			
Is v or v ₃ > 1.5 v ₁₂ / 2		Yes	
av ₃₄ 12			
If yes, v _{12A} = 2042		(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v	3337	4600	No
12A			

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_R + 0.0078 v_A - 0.00627 L = 23.9 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, M = 0.352

S

Space mean speed in ramp influence area, S = 60.1 mph

R

Space mean speed in outer lanes, S = 67.1 mph

0

Space mean speed for all vehicles, S = 61.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3322	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	193	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	404	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	750	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3322	193	404	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v_{15}	903	54	112	v
Trucks and buses	22	11	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.948	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	4008	226	471	pcph

Estimation of V12 Merge Areas

$$L = 1000.28 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.604 \text{ Using Equation 2}$$

FM

$$v_{12} = v_{12} (P) = 2419 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	4234	7200	No
FO			
v_{12} or v_{12}	1589 pc/h	(Equation 13-14 or 13-17)	
v_{12} or v_{12}			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
v_{12} or v_{12}			
Is v_{12} or v_{12}	> 1.5 v_{12} / 2	Yes	
v_{12} or v_{12}			
If yes, v_{12}	= 2419	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2645	4600	No
12A			

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 16.6 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.271$

S

Space mean speed in ramp influence area, $S = 62.4 \text{ mph}$

R

Space mean speed in outer lanes, $S = 66.1 \text{ mph}$

0

Space mean speed for all vehicles, $S = 63.7 \text{ mph}$

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2772	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	125	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	743	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2772	125	743	vph
Peak-hour factor, PHF	0.92	0.92	0.92	

Peak 15-min volume, v_{15}	753	34	202	v
Trucks and buses	22	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3344	143	848	pcph

Estimation of V12 Merge Areas

$$L = 840.42 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.619 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 2072 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	3487	7200	No
FO			
v_{12} or v_{12}	1272 pc/h	(Equation 13-14 or 13-17)	
3 av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
3 av34			
Is v_{12} or v_{12}	> 1.5 $v_{12} / 2$	Yes	
3 av34	12		
If yes, v_{12}	= 2072	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2215	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 13.3 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.252$

S

Space mean speed in ramp influence area, $S = 63.0 \text{ mph}$

R

Space mean speed in outer lanes, $S = 67.2 \text{ mph}$

0

Space mean speed for all vehicles, $S = 64.4 \text{ mph}$

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2400	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	154	vph
Length of first accel/decel lane	900	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	230	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1300	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2400	154	230	vph
Peak-hour factor, PHF	0.92	0.90	0.94	

Peak 15-min volume, v_{15}	652	43	61	v
Trucks and buses	22	16	25	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.926	0.889	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2896	185	275	pcph

Estimation of V12 Merge Areas

$L = 487.13$ (Equation 13-6 or 13-7)

EQ

$P = 0.603$ Using Equation 1

FM

$v_{12} = v_{12} (P) = 1745$ pc/h

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	3081	7200	No
FO			
v_{12} or v_{12}	1151 pc/h	(Equation 13-14 or 13-17)	
v_{12} or v_{12}			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
v_{12} or v_{12}			
Is v_{12} or v_{12}	$> 1.5 v_{12} / 2$	Yes	
v_{12} or v_{12}			
If yes, v_{12}	$= 1745$	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1930	4600	No
12A			

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 14.8$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.285$

S

Space mean speed in ramp influence area, $S = 62.0$ mph

R

Space mean speed in outer lanes, $S = 67.7$ mph

0

Space mean speed for all vehicles, $S = 64.0$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2362	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	66	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	192	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
	Ramp			
Volume, V (vph)	2362	66	192	vph
Peak-hour factor, PHF	0.92	0.92	0.90	

Peak 15-min volume, v ₁₅	642	18	53	v
Trucks and buses	22	36	46	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.901	0.847	0.813	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	2850	85	262	pcph

Estimation of V12 Merge Areas

L = (Equation 13-6 or 13-7)

EQ

P = 1.000 Using Equation 0

FM

v = v₁₂ (P_{FM}) = 2850 pc/h

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v _{FO}	2935	4800	No
v ₃ or v _{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v ₃ or v _{av34} > 2700 pc/h?		No	
Is v ₃ or v _{av34} > 1.5 v ₁₂ / 2		No	
If yes, v _{12A} = 2850		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v _{R12}	2935	4600	No

Level of Service Determination (if not F)

Density, D = $5.475 + 0.00734 v_R + 0.0078 v_A - 0.00627 L$ = 23.3 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, M = 0.338

S

Space mean speed in ramp influence area, S_R = 60.5 mph

R

Space mean speed in outer lanes, S₀ = N/A mph

0

Space mean speed for all vehicles, S = 60.5 mph

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Jedburg Road (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.93
Shoulder width	2.5 ft	% Trucks and buses	11 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 451 veh/h
Opposing direction volume, Vo 719 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.2	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.978	0.989
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	496 pc/h	782 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	1.3	mi/h
Average travel speed, ATSD	32.3	mi/h
Percent Free Flow Speed, PFFS	74.3	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	485 pc/h	773 pc/h
Base percent time-spent-following,(note-4) BPTSFd	53.5	%
Adjustment for no-passing zones, fnp	29.9	
Percent time-spent-following, PTSFd	65.0	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.29
Peak 15-min vehicle-miles of travel, VMT15	121 veh-mi
Peak-hour vehicle-miles of travel, VMT60	451 veh-mi
Peak 15-min total travel time, TT15	3.7 veh-h
Capacity from ATS, CdATS	1681 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1681 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.3	mi/h
Percent time-spent-following, PTSFd (from above)	65.0	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 484.9
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 7.39
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Jedburg Road (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.94
Shoulder width	2.5 ft	% Trucks and buses	11 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	60 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 994 veh/h
Opposing direction volume, Vo 683 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	1.000	0.989
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	1057 pc/h	735 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	1.0	mi/h
Average travel speed, ATSD	28.6	mi/h
Percent Free Flow Speed, PFFS	65.8	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	1057 pc/h	727 pc/h
Base percent time-spent-following,(note-4) BPTSFd	77.5	%
Adjustment for no-passing zones, fnp	19.5	
Percent time-spent-following, PTSFd	89.1	%

Level of Service and Other Performance Measures

Level of service, LOS	E
Volume to capacity ratio, v/c	0.62
Peak 15-min vehicle-miles of travel, VMT15	264 veh-mi
Peak-hour vehicle-miles of travel, VMT60	994 veh-mi
Peak 15-min total travel time, TT15	9.2 veh-h
Capacity from ATS, CdATS	1681 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1681 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	28.6	mi/h
Percent time-spent-following, PTSFd (from above)	89.1	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 1057.4
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 7.79
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Volvo Car Drive (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	6.0 ft	% Trucks and buses	10 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	20 %
Up/down	- %	Access point density	8 /mi

Analysis direction volume, Vd 928 veh/h
Opposing direction volume, Vo 625 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	1.000	0.990
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	1009 pc/h	686 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 0.0 mi/h
Adj. for access point density,(note-3) fA 2.0 mi/h

Free-flow speed, FFSd	48.0	mi/h
Adjustment for no-passing zones, fnp	0.5	mi/h
Average travel speed, ATSD	34.4	mi/h
Percent Free Flow Speed, PFFS	71.7	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	1009 pc/h	679 pc/h
Base percent time-spent-following,(note-4) BPTSFd	75.5	%
Adjustment for no-passing zones, fnp	16.3	
Percent time-spent-following, PTSFd	85.2	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.59
Peak 15-min vehicle-miles of travel, VMT15	252 veh-mi
Peak-hour vehicle-miles of travel, VMT60	928 veh-mi
Peak 15-min total travel time, TT15	7.3 veh-h
Capacity from ATS, CdATS	1683 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1683 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	34.4	mi/h
Percent time-spent-following, PTSFd (from above)	85.2	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 1008.7
Effective width of outside lane, We 24.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.45
Bicycle LOS E

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 27 (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.93
Shoulder width	1.0 ft	% Trucks and buses	16 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	30 /mi

Analysis direction volume, Vd 549 veh/h
Opposing direction volume, Vo 500 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.2
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.984	0.969
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	600 pc/h	555 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 7.5 mi/h

Free-flow speed, FFSd	43.3	mi/h
Adjustment for no-passing zones, fnp	2.0	mi/h
Average travel speed, ATSD	32.3	mi/h
Percent Free Flow Speed, PFFS	74.7	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	590 pc/h	538 pc/h
Base percent time-spent-following,(note-4) BPTSFd	57.5	%
Adjustment for no-passing zones, fnp	36.0	
Percent time-spent-following, PTSFd	76.3	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.35
Peak 15-min vehicle-miles of travel, VMT15	148 veh-mi
Peak-hour vehicle-miles of travel, VMT60	549 veh-mi
Peak 15-min total travel time, TT15	4.6 veh-h
Capacity from ATS, CdATS	1647 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1647 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.3	mi/h
Percent time-spent-following, PTSFd (from above)	76.3	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 590.3
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 10.01
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 27 (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.91
Shoulder width	2.5 ft	% Trucks and buses	16 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	10 /mi

Analysis direction volume, Vd 695 veh/h
Opposing direction volume, Vo 480 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.2
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.984	0.969
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	776 pc/h	544 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 2.5 mi/h

Free-flow speed, FFSd	49.5	mi/h
Adjustment for no-passing zones, fnp	2.1	mi/h
Average travel speed, ATSD	37.1	mi/h
Percent Free Flow Speed, PFFS	75.0	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	764 pc/h	527 pc/h
Base percent time-spent-following,(note-4) BPTSFd	65.4	%
Adjustment for no-passing zones, fnp	30.0	
Percent time-spent-following, PTSFd	83.2	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.46
Peak 15-min vehicle-miles of travel, VMT15	191 veh-mi
Peak-hour vehicle-miles of travel, VMT60	695 veh-mi
Peak 15-min total travel time, TT15	5.1 veh-h
Capacity from ATS, CdATS	1647 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1647 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	37.1	mi/h
Percent time-spent-following, PTSFd (from above)	83.2	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 763.7
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 10.01
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 453 (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	1.0 ft	% Trucks and buses	36 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	75 %
Up/down	- %	Access point density	4 /mi

Analysis direction volume, Vd 234 veh/h
Opposing direction volume, Vo 151 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.4	1.6
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.874	0.822
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	291 pc/h	200 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.7 mi/h
Adj. for access point density,(note-3) fA 1.0 mi/h

Free-flow speed, FFSd	39.3	mi/h
Adjustment for no-passing zones, fnp	3.6	mi/h
Average travel speed, ATSD	31.9	mi/h
Percent Free Flow Speed, PFFS	81.1	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.965	0.965
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	264 pc/h	170 pc/h
Base percent time-spent-following,(note-4) BPTSFd	27.2	%
Adjustment for no-passing zones, fnp	53.7	
Percent time-spent-following, PTSFd	59.9	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.17
Peak 15-min vehicle-miles of travel, VMT15	64 veh-mi
Peak-hour vehicle-miles of travel, VMT60	234 veh-mi
Peak 15-min total travel time, TT15	2.0 veh-h
Capacity from ATS, CdATS	1397 veh/h
Capacity from PTSF, CdPTSF	1641 veh/h
Directional Capacity	1397 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	31.9	mi/h
Percent time-spent-following, PTSFd (from above)	59.9	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 254.3
Effective width of outside lane, We 12.50
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 24.36
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 453 (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	36 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	70 %
Up/down	- %	Access point density	16 /mi

Analysis direction volume, Vd 227 veh/h
Opposing direction volume, Vo 190 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.4	1.5
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.874	0.847
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	289 pc/h	249 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 4.0 mi/h

Free-flow speed, FFSd	36.8	mi/h
Adjustment for no-passing zones, fnp	3.2	mi/h
Average travel speed, ATSD	29.5	mi/h
Percent Free Flow Speed, PFFS	80.1	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.965	0.965
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	261 pc/h	219 pc/h
Base percent time-spent-following,(note-4) BPTSFd	27.9	%
Adjustment for no-passing zones, fnp	56.6	
Percent time-spent-following, PTSFd	58.7	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.17
Peak 15-min vehicle-miles of travel, VMT15	63 veh-mi
Peak-hour vehicle-miles of travel, VMT60	227 veh-mi
Peak 15-min total travel time, TT15	2.1 veh-h
Capacity from ATS, CdATS	1440 veh/h
Capacity from PTSF, CdPTSF	1641 veh/h
Directional Capacity	1440 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	29.5	mi/h
Percent time-spent-following, PTSFd (from above)	58.7	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 252.2
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 24.29
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Jedburg Road (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.93
Shoulder width	2.5 ft	% Trucks and buses	11 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 719 veh/h
Opposing direction volume, Vo 451 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.2
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.989	0.978
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	782 pc/h	496 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	2.3	mi/h
Average travel speed, ATSD	31.3	mi/h
Percent Free Flow Speed, PFFS	72.0	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	773 pc/h	485 pc/h
Base percent time-spent-following,(note-4) BPTSFd	65.8	%
Adjustment for no-passing zones, fnp	29.9	
Percent time-spent-following, PTSFd	84.2	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.46
Peak 15-min vehicle-miles of travel, VMT15	193 veh-mi
Peak-hour vehicle-miles of travel, VMT60	719 veh-mi
Peak 15-min total travel time, TT15	6.2 veh-h
Capacity from ATS, CdATS	1663 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1663 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	31.3	mi/h
Percent time-spent-following, PTSFd (from above)	84.2	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 773.1
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 7.63
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Jedburg Road (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.94
Shoulder width	2.5 ft	% Trucks and buses	11 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	60 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 683 veh/h
Opposing direction volume, Vo 994 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.989	1.000
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	735 pc/h	1057 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	0.6	mi/h
Average travel speed, ATSD	29.0	mi/h
Percent Free Flow Speed, PFFS	66.7	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	727 pc/h	1057 pc/h
Base percent time-spent-following,(note-4) BPTSFd	69.0	%
Adjustment for no-passing zones, fnp	19.5	
Percent time-spent-following, PTSFd	76.9	%

Level of Service and Other Performance Measures

Level of service, LOS	E
Volume to capacity ratio, v/c	0.43
Peak 15-min vehicle-miles of travel, VMT15	182 veh-mi
Peak-hour vehicle-miles of travel, VMT60	683 veh-mi
Peak 15-min total travel time, TT15	6.3 veh-h
Capacity from ATS, CdATS	1700 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1700 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	29.0	mi/h
Percent time-spent-following, PTSFd (from above)	76.9	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 726.6
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 7.60
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Volvo Car Drive (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	6.0 ft	% Trucks and buses	10 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	20 %
Up/down	- %	Access point density	8 /mi

Analysis direction volume, Vd 625 veh/h
Opposing direction volume, Vo 928 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.990	1.000
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	686 pc/h	1009 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 0.0 mi/h
Adj. for access point density,(note-3) fA 2.0 mi/h

Free-flow speed, FFSd	48.0	mi/h
Adjustment for no-passing zones, fnp	0.4	mi/h
Average travel speed, ATSD	34.5	mi/h
Percent Free Flow Speed, PFFS	71.8	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	679 pc/h	1009 pc/h
Base percent time-spent-following,(note-4) BPTSFd	66.4	%
Adjustment for no-passing zones, fnp	16.3	
Percent time-spent-following, PTSFd	73.0	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.40
Peak 15-min vehicle-miles of travel, VMT15	170 veh-mi
Peak-hour vehicle-miles of travel, VMT60	625 veh-mi
Peak 15-min total travel time, TT15	4.9 veh-h
Capacity from ATS, CdATS	1700 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1700 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	34.5	mi/h
Percent time-spent-following, PTSFd (from above)	73.0	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 679.3
Effective width of outside lane, We 24.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.25
Bicycle LOS E

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 27 (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.93
Shoulder width	1.0 ft	% Trucks and buses	16 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	30 /mi

Analysis direction volume, Vd 500 veh/h
Opposing direction volume, Vo 549 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.2	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.969	0.984
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	555 pc/h	600 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 7.5 mi/h

Free-flow speed, FFSd	43.3	mi/h
Adjustment for no-passing zones, fnp	1.8	mi/h
Average travel speed, ATSD	32.5	mi/h
Percent Free Flow Speed, PFFS	75.1	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	538 pc/h	590 pc/h
Base percent time-spent-following,(note-4) BPTSFd	53.9	%
Adjustment for no-passing zones, fnp	36.0	
Percent time-spent-following, PTSFd	71.1	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.33
Peak 15-min vehicle-miles of travel, VMT15	134 veh-mi
Peak-hour vehicle-miles of travel, VMT60	500 veh-mi
Peak 15-min total travel time, TT15	4.1 veh-h
Capacity from ATS, CdATS	1673 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1673 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.5	mi/h
Percent time-spent-following, PTSFd (from above)	71.1	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 537.6
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 9.97
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 27 (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.91
Shoulder width	2.5 ft	% Trucks and buses	16 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	10 /mi

Analysis direction volume, Vd 480 veh/h
Opposing direction volume, Vo 695 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.2	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.969	0.984
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	544 pc/h	776 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 2.5 mi/h

Free-flow speed, FFSd	49.5	mi/h
Adjustment for no-passing zones, fnp	1.4	mi/h
Average travel speed, ATSD	37.9	mi/h
Percent Free Flow Speed, PFFS	76.6	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	527 pc/h	764 pc/h
Base percent time-spent-following,(note-4) BPTSFd	56.5	%
Adjustment for no-passing zones, fnp	30.0	
Percent time-spent-following, PTSFd	68.7	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.32
Peak 15-min vehicle-miles of travel, VMT15	132 veh-mi
Peak-hour vehicle-miles of travel, VMT60	480 veh-mi
Peak 15-min total travel time, TT15	3.5 veh-h
Capacity from ATS, CdATS	1673 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1673 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	37.9	mi/h
Percent time-spent-following, PTSFd (from above)	68.7	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 527.5
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 9.82
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 453 (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	1.0 ft	% Trucks and buses	36 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	75 %
Up/down	- %	Access point density	4 /mi

Analysis direction volume, Vd 151 veh/h
Opposing direction volume, Vo 234 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.6	1.4
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.822	0.874
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	200 pc/h	291 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.7 mi/h
Adj. for access point density,(note-3) fA 1.0 mi/h

Free-flow speed, FFSd	39.3	mi/h
Adjustment for no-passing zones, fnp	3.1	mi/h
Average travel speed, ATSD	32.4	mi/h
Percent Free Flow Speed, PFFS	82.5	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.965	0.965
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	170 pc/h	264 pc/h
Base percent time-spent-following,(note-4) BPTSFd	20.7	%
Adjustment for no-passing zones, fnp	53.7	
Percent time-spent-following, PTSFd	41.7	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.12
Peak 15-min vehicle-miles of travel, VMT15	41 veh-mi
Peak-hour vehicle-miles of travel, VMT60	151 veh-mi
Peak 15-min total travel time, TT15	1.3 veh-h
Capacity from ATS, CdATS	1486 veh/h
Capacity from PTSF, CdPTSF	1641 veh/h
Directional Capacity	1486 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.4	mi/h
Percent time-spent-following, PTSFd (from above)	41.7	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 164.1
Effective width of outside lane, We 15.56
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 23.71
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 453 (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	36 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	70 %
Up/down	- %	Access point density	16 /mi

Analysis direction volume, Vd 190 veh/h
Opposing direction volume, Vo 227 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.5	1.4
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.847	0.874
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	249 pc/h	289 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 4.0 mi/h

Free-flow speed, FFSd	36.8	mi/h
Adjustment for no-passing zones, fnp	2.9	mi/h
Average travel speed, ATSD	29.7	mi/h
Percent Free Flow Speed, PFFS	80.7	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.965	0.965
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	219 pc/h	261 pc/h
Base percent time-spent-following,(note-4) BPTSFd	24.4	%
Adjustment for no-passing zones, fnp	56.6	
Percent time-spent-following, PTSFd	50.2	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.15
Peak 15-min vehicle-miles of travel, VMT15	53 veh-mi
Peak-hour vehicle-miles of travel, VMT60	190 veh-mi
Peak 15-min total travel time, TT15	1.8 veh-h
Capacity from ATS, CdATS	1486 veh/h
Capacity from PTSF, CdPTSF	1641 veh/h
Directional Capacity	1486 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	29.7	mi/h
Percent time-spent-following, PTSFd (from above)	50.2	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 211.1
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 24.20
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2604	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	37	vph
Length of first accel/decel lane	465	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	194	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2604	37	194	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v_{15}	708	10	54	v
Trucks and buses	10	52	24	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.794	0.893	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2972	52	241	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 2972$ pc/h

$v_{12} = 2972$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	2972	4800	No
$v_{12} = v_F + v_R$	2920	4800	No
$v_{12} = v_F + v_R$	52	2000	No
$v_{12} = v_F + v_R$	0 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} > 2700$ pc/h?		No	
Is $v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 2972$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2972	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 25.6$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.433$

S

Space mean speed in ramp influence area, $S = 57.9$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 57.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2761	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	178	vph
Length of first accel/decel lane	250	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	686	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	4000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2761	178	686	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v_{15}	750	49	191	v
Trucks and buses	10	8	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.962	0.966	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3151	206	789	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.672$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 2184$ pc/h

$v_{12} = 2184$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	3151	7200	No
$v_{12} = v_F - v_R$	2945	7200	No
$v_{12} = v_R$	206	2000	No
v_{12} or v_{12}	967 pc/h	(Equation 13-14 or 13-17)	
Is v_{12} or $v_{12} > 2700$ pc/h?		No	
Is v_{12} or $v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 2184$	(Equation 13-15, 13-16, 13-18, or 13-19)		

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2184	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 20.8$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.447$

S

Space mean speed in ramp influence area, $S = 57.5$ mph

R

Space mean speed in outer lanes, S = 76.8 mph

0

Space mean speed for all vehicles, S = 62.3 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3269	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	86	vph
Length of first accel/decel lane	1200	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	623	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	3500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3269	86	623	vph
Peak-hour factor, PHF	0.92	0.92	0.92	

Peak 15-min volume, v_{15}	888	23	169	v
Trucks and buses	10	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3731	98	711	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.662$ Using Equation 5

FD

$v_{12} = v_R + (v_F - v_R) P = 2504$ pc/h

$v_{12} = 2504$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_R$	3731	7200	No
$v_{12} = v_F$			
$v_{12} = v_F - v_R$	3633	7200	No
$v_{12} = v_F$			
$v_{12} = v_R$	98	2000	No
$v_{12} = v_F$			
$v_{12} = v_F$	1227 pc/h	(Equation 13-14 or 13-17)	
$v_{12} = v_F$			
Is $v_{12} > 2700$ pc/h?		No	
Is $v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 2504$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2504	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 15.0$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.437$

S

Space mean speed in ramp influence area, $S = 57.8$ mph

R

Space mean speed in outer lanes, S = 75.9 mph

0

Space mean speed for all vehicles, S = 62.7 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3806	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	202	vph
Length of first accel/decel lane	180	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	824	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2900	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3806	202	824	vph
Peak-hour factor, PHF	0.92	0.91	0.90	

Peak 15-min volume, v_{15}	1034	55	229	v
Trucks and buses	10	19	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.913	0.966	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	4344	243	948	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.640$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 2869$ pc/h

$v_{12} = 2869$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	4344	7200	No
$v_{12} = v_F - v_R$	4101	7200	No
$v_{12} = v_R$	243	2000	No
v_{12} or v_{12}	1475 pc/h	(Equation 13-14 or 13-17)	
v_{12} or v_{12}	> 2700 pc/h?	No	
v_{12} or v_{12}	$> 1.5 v_{12} / 2$	No	
If yes, $v_{12} = 2869$	(Equation 13-15, 13-16, 13-18, or 13-19)		

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2869	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 27.3$ pc/mi/ln

$D = 27.3$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.450$

S

Space mean speed in ramp influence area, $S = 57.4$ mph

R

Space mean speed in outer lanes, S = 74.9 mph

0

Space mean speed for all vehicles, S = 62.4 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	4815	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	802	vph
Length of first accel/decel lane	850	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	198	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	750	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	4815	802	198	vph
Peak-hour factor, PHF	0.93	0.95	0.90	

Peak 15-min volume, v_{15}	1294	211	55	v
Trucks and buses	15	6	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.971	0.966	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	5566	870	228	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.581$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 3598$ pc/h

$v_{12} = 3598$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	5566	7200	No
$v_{12} = v_F - v_R$	4696	7200	No
$v_{12} = v_R$	870	2000	No
v_{12} or v_{12}	1968 pc/h	(Equation 13-14 or 13-17)	
v_{12} or v_{12}	> 2700 pc/h?	No	
v_{12} or v_{12}	$> 1.5 v_{12} / 2$	No	
If yes, $v_{12} = 3598$	(Equation 13-15, 13-16, 13-18, or 13-19)		

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3598	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 27.5$ pc/mi/ln

$D = 27.5$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.506$

S

Space mean speed in ramp influence area, $S = 55.8$ mph

R

Space mean speed in outer lanes, S = 73.0 mph

0

Space mean speed for all vehicles, S = 60.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	5170	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	355	vph
Length of first accel/decel lane	150	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	802	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	920	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	5170	355	802	vph
Peak-hour factor, PHF	0.93	0.95	0.95	

Peak 15-min volume, v_{15}	1390	93	211	v
Trucks and buses	15	6	6	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	5976	385	870	pcph

Estimation of V12 Diverge Areas

$$L = 1066.12 \text{ (Equation 13-12 or 13-13)}$$

EQ

$$P = 0.608 \text{ Using Equation 7}$$

FD

$$v_{12} = v_F + (v_R - v_F) P = 3783 \text{ pc/h}$$

12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	5976	7200	No
$v_{12} = v_F - v_R$	5591	7200	No
$v_{12} = v_F$	385	2000	No
$v_{12} \text{ or } v_{12}$	2193 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_{12} > 2700 \text{ pc/h?}$		No	
Is $v_{12} \text{ or } v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 3783$	(Equation 13-15, 13-16, 13-18, or 13-19)		
12A			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3783	4400	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L = 35.4 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence E

Speed Estimation

$$\text{Intermediate speed variable, } D = 0.463$$

S

$$\text{Space mean speed in ramp influence area, } S = 57.0 \text{ mph}$$

R

Space mean speed in outer lanes, S = 72.1 mph

0

Space mean speed for all vehicles, S = 61.8 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	4211	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	347	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane	1500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	156	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	4211	347	156	vph
Peak-hour factor, PHF	0.93	0.92	0.92	

Peak 15-min volume, v_{15}	1132	94	42	v
Trucks and buses	15	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	4868	396	178	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.450$ Using Equation 0

FD

$v_{12R} = v_F + (v - v_F) P = 2408$ pc/h

$12R$ F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12R} = v_F$	4868	7200	No
F_i F			
$v_{12R} = v_F - v_{12R}$	4472	7200	No
F_O F R			
v_{12R}	396	4000	No
R			
v_{12R} or v_{12R}	2460 pc/h	(Equation 13-14 or 13-17)	
3 av34			
Is v_{12R} or $v_{12R} > 2700$ pc/h?		No	
3 av34			
Is v_{12R} or $v_{12R} > 1.5 v_{12R} / 2$		Yes	
3 av34	12		
If yes, $v_{12A} = 2781$		(Equation 13-15, 13-16, 13-18, or 13-19)	
$12A$			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2781	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12R} - 0.009 L = -12.3$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable, $D = 0.464$

S

Space mean speed in ramp influence area, $S = 57.0$ mph

R

Space mean speed in outer lanes, S = 72.6 mph

0

Space mean speed for all vehicles, S = 62.8 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3640	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	292	vph
Length of first accel/decel lane	650	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	205	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1300	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3640	292	205	vph
Peak-hour factor, PHF	0.93	0.91	0.90	

Peak 15-min volume, v_{15}	978	80	57	v
Trucks and buses	15	7	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.966	0.966	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	4208	332	236	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.640$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 2811$ pc/h

$v_{12} = 2811$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	4208	7200	No
$v_{12} = v_F - v_R$	3876	7200	No
$v_{12} = v_F$	332	2000	No
$v_{12} \text{ or } v_{12}$	1397 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_{12} > 2700$ pc/h?		No	
Is $v_{12} \text{ or } v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 2811$	(Equation 13-15, 13-16, 13-18, or 13-19)		
$v_{12} = 2811$			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2811	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 22.6$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.458$

S

Space mean speed in ramp influence area, $S = 57.2$ mph

R

Space mean speed in outer lanes, S = 75.2 mph

0

Space mean speed for all vehicles, S = 62.1 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	4020	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	380	vph
Length of first accel/decel lane	250	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	292	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	1775	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	4020	380	292	vph
Peak-hour factor, PHF	0.93	0.91	0.91	

Peak 15-min volume, v_{15}	1081	104	80	v
Trucks and buses	15	7	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.966	0.966	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	4647	432	332	pcph

Estimation of V12 Diverge Areas

$$L = 394.59 \text{ (Equation 13-12 or 13-13)}$$

EQ

$$P = 0.624 \text{ Using Equation 5}$$

FD

$$v_{12} = v_F + (v_R - v_F) P = 3062 \text{ pc/h}$$

12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	4647	7200	No
$v_{12} = v_F - v_R$	4215	7200	No
$v_{12} = v_R$	432	2000	No
$v_{12} \text{ or } v_{12}$	1585 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_{12} > 2700 \text{ pc/h?}$		No	
Is $v_{12} \text{ or } v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 3062$	(Equation 13-15, 13-16, 13-18, or 13-19)		
12A			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3062	4400	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L = 28.3 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

$$\text{Intermediate speed variable, } D = 0.467$$

S

$$\text{Space mean speed in ramp influence area, } S = 56.9 \text{ mph}$$

R

Space mean speed in outer lanes, S = 74.5 mph

0

Space mean speed for all vehicles, S = 61.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3553	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	198	vph
Length of first accel/decel lane	475	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	69	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3553	198	69	vph
Peak-hour factor, PHF	0.93	0.90	0.90	

Peak 15-min volume, v_{15}	955	55	19	v
Trucks and buses	15	21	24	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.905	0.893	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	4107	243	86	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 4107$ pc/h

$v_{12} = 4107$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	4107	4800	No
$v_{12} = v_F - v_R$	3864	4800	No
$v_{12} = v_F$	243	2000	No
$v_{12} \text{ or } v_R$	0 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_R > 2700$ pc/h?		No	
Is $v_{12} \text{ or } v_R > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 4107$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	4107	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 35.3$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence E

Speed Estimation

Intermediate speed variable, $D = 0.450$

S

Space mean speed in ramp influence area, $S = 57.4$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 57.4 mph

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: West of SC 453
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2604	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	708	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1486	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.2	mi/h
Free-flow speed, FFS	72.2	mi/h

LOS and Performance Measures

Flow rate, vp	1486	pc/h/ln
Free-flow speed, FFS	72.2	mi/h
Average passenger-car speed, S	69.1	mi/h
Number of lanes, N	2	
Density, D	21.5	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Between SC 453 Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2567	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	698	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1465	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.33	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.3	mi/h
Free-flow speed, FFS	74.1	mi/h

LOS and Performance Measures

Flow rate, vp	1465	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	72.6	mi/h
Number of lanes, N	2	
Density, D	20.2	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: SC 453 to SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2761	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	750	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1576	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	1576	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	71.3	mi/h
Number of lanes, N	2	
Density, D	22.1	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Between SC 27 Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2583	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	702	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	983	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	983	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	13.1	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Between SC 27 & Volvo
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3269	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	888	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1244	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1244	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	74.3	mi/h
Number of lanes, N	3	
Density, D	16.7	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Between Volvo Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3183	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	865	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1211	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1211	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	74.5	mi/h
Number of lanes, N	3	
Density, D	16.3	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Volvo to Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3806	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1034	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1448	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1448	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	72.8	mi/h
Number of lanes, N	3	
Density, D	19.9	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3604	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	979	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1371	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.50	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.8	mi/h
Free-flow speed, FFS	73.6	mi/h

LOS and Performance Measures

Flow rate, vp	1371	pc/h/ln
Free-flow speed, FFS	73.6	mi/h
Average passenger-car speed, S	73.5	mi/h
Number of lanes, N	3	
Density, D	18.7	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Jedburg to Nexton
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	4428	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1203	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1685	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.20	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.8	mi/h
Free-flow speed, FFS	71.6	mi/h

LOS and Performance Measures

Flow rate, vp	1685	pc/h/ln
Free-flow speed, FFS	71.6	mi/h
Average passenger-car speed, S	67.3	mi/h
Number of lanes, N	3	
Density, D	25.0	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Nexton to Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	5170	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	1390	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1992	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.33	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	4.1	mi/h
Free-flow speed, FFS	71.3	mi/h

LOS and Performance Measures

Flow rate, vp	1992	pc/h/ln
Free-flow speed, FFS	71.3	mi/h
Average passenger-car speed, S	62.7	mi/h
Number of lanes, N	3	
Density, D	31.8	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	4013	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	1079	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1546	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1546	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	71.7	mi/h
Number of lanes, N	3	
Density, D	21.6	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	4815	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	1294	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1855	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1855	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	66.9	mi/h
Number of lanes, N	3	
Density, D	27.7	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Jedburg to Volvo
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	4211	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	1132	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1623	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	1623	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	70.7	mi/h
Number of lanes, N	3	
Density, D	23.0	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between Volvo Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3864	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	1039	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1489	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	1489	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	72.4	mi/h
Number of lanes, N	3	
Density, D	20.6	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between Volvo & SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	4020	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	1081	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1549	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	1549	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	71.7	mi/h
Number of lanes, N	3	
Density, D	21.6	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between SC 27 Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3348	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	900	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1290	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	1290	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	74.1	mi/h
Number of lanes, N	3	
Density, D	17.4	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between SC 27 Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3640	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	978	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1403	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	1403	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	73.2	mi/h
Number of lanes, N	3	
Density, D	19.2	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: SC 27 to SC 453
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3553	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	955	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	2053	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	2053	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	62.7	mi/h
Number of lanes, N	2	
Density, D	32.7	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between SC 453 Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3355	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	902	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1939	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.33	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.3	mi/h
Free-flow speed, FFS	74.1	mi/h

LOS and Performance Measures

Flow rate, vp	1939	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	65.2	mi/h
Number of lanes, N	2	
Density, D	29.7	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: West of SC 453
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3424	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	920	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1979	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.2	mi/h
Free-flow speed, FFS	72.2	mi/h

LOS and Performance Measures

Flow rate, vp	1979	pc/h/ln
Free-flow speed, FFS	72.2	mi/h
Average passenger-car speed, S	63.0	mi/h
Number of lanes, N	2	
Density, D	31.4	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2567	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	194	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	37	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2567	194	37	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v_{15}	698	54	10	v
Trucks and buses	10	24	52	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.893	0.794	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2930	241	52	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)

EQ

$P = 1.000$ Using Equation 0

FM

$v_{12} = v_{12} (P) = 2930$ pc/h

FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	3171	4800	No
FO			
v_{12} or v_{12}	0 pc/h	(Equation 13-14 or 13-17)	
$\frac{v_{12}}{3}$ av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
$\frac{v_{12}}{3}$ av34			
Is v_{12} or v_{12}	$> 1.5 \frac{v_{12}}{12}$	No	
$\frac{v_{12}}{3}$ av34			
If yes, $v_{12} = 2930$		(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3171	4600	No
R12			

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 \frac{v_{12}}{R} + 0.0078 \frac{v_{12}}{A} - 0.00627 L = 25.1$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $M = 0.358$

S

Space mean speed in ramp influence area, $S = 60.0$ mph

R

Space mean speed in outer lanes, $S = N/A$ mph

0

Space mean speed for all vehicles, $S = 60.0$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2583	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	686	vph
Length of first accel/decel lane	900	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	178	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	4000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
	Ramp			
Volume, V (vph)	2583	686	178	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v ₁₅	702	191	49	v
Trucks and buses	10	7	8	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.952	0.966	0.962	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	2948	789	206	pcph

Estimation of V12 Merge Areas

$$L = 627.52 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.603 \text{ Using Equation 1}$$

FM

$$v = v(P) = 1777 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v	3737	7200	No
FO			
v or v ₃	1171 pc/h	(Equation 13-14 or 13-17)	
av ₃₄			
Is v or v ₃	> 2700 pc/h?	No	
av ₃₄			
Is v or v ₃	> 1.5 v ₁₂ / 2	Yes	
av ₃₄	12		
If yes, v _{12A}	= 1777	(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v _{12A}	2566	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_R + 0.0078 v_A - 0.00627 L = 19.5 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, M = 0.309

S

Space mean speed in ramp influence area, S = 61.4 mph

R

Space mean speed in outer lanes, S = 67.6 mph

0

Space mean speed for all vehicles, S = 63.2 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3183	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-flow speed on ramp	35.0	mph
Volume on ramp	623	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane	1500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	86	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	3500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3183	623	86	vph
Peak-hour factor, PHF	0.92	0.92	0.92	

Peak 15-min volume, v_{15}	865	169	23	v
Trucks and buses	10	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3633	711	98	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)

EQ

$P = 0.555$ Using Equation 0

FM

$v_{12} = v_{12} (P) = 2016$ pc/h

12 F FM

Capacity Checks

v_{12}	Actual 4344	Maximum 7200	LOS F? No
FO			
v_{12} or v_{12}	1617 pc/h	(Equation 13-14 or 13-17)	
v_{12} or v_{12}			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
v_{12} or v_{12}			
Is v_{12} or v_{12}	$> 1.5 v_{12} / 2$	Yes	
v_{12} or v_{12}			
If yes, v_{12}	$= 2076$	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

v_{12}	Actual 2787	Max Desirable 4600	Violation? No
12A			

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = -1.3$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable, $M = 0.069$

S

Space mean speed in ramp influence area, $S = 68.1$ mph

R

Space mean speed in outer lanes, $S = 66.2$ mph

0

Space mean speed for all vehicles, $S = 67.4$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3604	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	824	vph
Length of first accel/decel lane	1120	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	202	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2900	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3604	824	202	vph
Peak-hour factor, PHF	0.92	0.90	0.91	

Peak 15-min volume, v_{15}	979	229	55	v
Trucks and buses	10	7	19	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.966	0.913	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	4113	948	243	pcph

Estimation of V12 Merge Areas

$$L = 1008.53 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.609 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 2504 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	5061	7200	No
FO			
v_{12} or v_{12}	1609 pc/h	(Equation 13-14 or 13-17)	
$\frac{v_{12}}{3}$ av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
$\frac{v_{12}}{3}$ av34			
Is v_{12} or v_{12}	> 1.5 $v_{12} / 2$	Yes	
$\frac{v_{12}}{3}$ av34	12		
If yes, v_{12}	= 2504	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3452	4600	No
12A			

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_A - 0.00627 L = 24.9 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

$$\text{Intermediate speed variable, } M = 0.366$$

S

$$\text{Space mean speed in ramp influence area, } S_R = 59.8 \text{ mph}$$

R

$$\text{Space mean speed in outer lanes, } S_O = 66.0 \text{ mph}$$

0

$$\text{Space mean speed for all vehicles, } S = 61.6 \text{ mph}$$

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	4013	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	198	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	802	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	750	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	4013	198	802	vph
Peak-hour factor, PHF	0.93	0.90	0.95	

Peak 15-min volume, v ₁₅	1079	55	211	v
Trucks and buses	15	7	6	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.930	0.966	0.971	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	4639	228	870	pcph

Estimation of V12 Merge Areas

$$L = 1135.74 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.595 \text{ Using Equation 2}$$

FM

$$v_{12} = v_{12} (P) = 2761 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v ₁₂	4867	7200	No
FO			
v ₁₂ or v ₃₄	1878 pc/h	(Equation 13-14 or 13-17)	
Is v ₁₂ or v ₃₄ > 2700 pc/h?		No	
Is v ₁₂ or v ₃₄ > 1.5 v ₁₂ / 2		Yes	
If yes, v _{12A} = 2761		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v _{12A}	2989	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_A - 0.00627 L = 19.3 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

$$\text{Intermediate speed variable, } M = 0.293$$

S

$$\text{Space mean speed in ramp influence area, } S_R = 61.8 \text{ mph}$$

R

$$\text{Space mean speed in outer lanes, } S_0 = 65.0 \text{ mph}$$

0

$$\text{Space mean speed for all vehicles, } S = 63.0 \text{ mph}$$

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3864	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	156	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	347	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3864	156	347	vph
Peak-hour factor, PHF	0.93	0.92	0.92	

Peak 15-min volume, v_{15}	1039	42	94	v
Trucks and buses	15	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	4466	178	396	pcph

Estimation of V12 Merge Areas

$$L = 1088.02 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.619 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 2767 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	4644	7200	No
FO			
v_{12} or v_{12}	1699 pc/h	(Equation 13-14 or 13-17)	
3 av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
3 av34			
Is v_{12} or v_{12}	> 1.5 $v_{12} / 2$	Yes	
3 av34	12		
If yes, v_{12}	= 2767	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2945	4600	No
12A			

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_A - 0.00627 L = 19.0 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.290$

S

Space mean speed in ramp influence area, $S = 61.9 \text{ mph}$

R

Space mean speed in outer lanes, $S = 65.7 \text{ mph}$

0

Space mean speed for all vehicles, $S = 63.2 \text{ mph}$

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3348	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	205	vph
Length of first accel/decel lane	900	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	292	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1300	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3348	205	292	vph
Peak-hour factor, PHF	0.93	0.90	0.91	

Peak 15-min volume, v_{15}	900	57	80	v
Trucks and buses	15	7	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.966	0.966	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3870	236	332	pcph

Estimation of V12 Merge Areas

$$L = 706.48 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.603 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 2332 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	4106	7200	No
FO			
v_{12} or v_{12}	1538 pc/h	(Equation 13-14 or 13-17)	
v_{12} or v_{12}			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
v_{12} or v_{12}			
Is v_{12} or v_{12}	> 1.5 v_{12} / 2	Yes	
v_{12} or v_{12}			
If yes, v_{12}	= 2332	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2568	4600	No
12A			

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 19.8 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.309$

S

Space mean speed in ramp influence area, $S = 61.4 \text{ mph}$

R

Space mean speed in outer lanes, $S = 66.3 \text{ mph}$

0

Space mean speed for all vehicles, $S = 63.1 \text{ mph}$

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3355	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	69	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	198	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3355	69	198	vph
Peak-hour factor, PHF	0.93	0.90	0.90	

Peak 15-min volume, v ₁₅	902	19	55	v
Trucks and buses	15	24	21	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.930	0.893	0.905	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	3878	86	243	pcph

Estimation of V₁₂ Merge Areas

L = (Equation 13-6 or 13-7)

EQ

P = 1.000 Using Equation 0

FM

v = v₁₂ (P) = 3878 pc/h

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v	3964	4800	No
FO			
v or v ₃	0 pc/h	(Equation 13-14 or 13-17)	
av ₃₄			
Is v or v ₃	> 2700 pc/h?	No	
av ₃₄			
Is v or v ₃	> 1.5 v ₁₂ / 2	No	
av ₃₄	12		
If yes, v _{12A}	= 3878	(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v	3964	4600	No
R ₁₂			

Level of Service Determination (if not F)

Density, D = $5.475 + 0.00734 v_R + 0.0078 v_A - 0.00627 L$ = 31.3 pc/mi/ln

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable, M = 0.470

S

Space mean speed in ramp influence area, S = 56.8 mph

R

Space mean speed in outer lanes, S = N/A mph

0

Space mean speed for all vehicles, S = 56.8 mph

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Jedburg Road (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.95
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 718 veh/h
Opposing direction volume, Vo 521 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.2
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.993	0.986
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	761 pc/h	556 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	2.0	mi/h
Average travel speed, ATSD	31.3	mi/h
Percent Free Flow Speed, PFFS	71.9	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	756 pc/h	548 pc/h
Base percent time-spent-following,(note-4) BPTSFd	65.1	%
Adjustment for no-passing zones, fnp	29.9	
Percent time-spent-following, PTSFd	82.4	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.45
Peak 15-min vehicle-miles of travel, VMT15	189 veh-mi
Peak-hour vehicle-miles of travel, VMT60	718 veh-mi
Peak 15-min total travel time, TT15	6.0 veh-h
Capacity from ATS, CdATS	1676 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1676 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	31.3	mi/h
Percent time-spent-following, PTSFd (from above)	82.4	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 755.8
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 6.08
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Jedburg Road (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	60 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 877 veh/h
Opposing direction volume, Vo 1069 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	1.000	1.000
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	953 pc/h	1162 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	0.6	mi/h
Average travel speed, ATSD	26.5	mi/h
Percent Free Flow Speed, PFFS	60.9	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	953 pc/h	1162 pc/h
Base percent time-spent-following,(note-4) BPTSFd	78.4	%
Adjustment for no-passing zones, fnp	15.3	
Percent time-spent-following, PTSFd	85.3	%

Level of Service and Other Performance Measures

Level of service, LOS	E
Volume to capacity ratio, v/c	0.56
Peak 15-min vehicle-miles of travel, VMT15	238 veh-mi
Peak-hour vehicle-miles of travel, VMT60	877 veh-mi
Peak 15-min total travel time, TT15	9.0 veh-h
Capacity from ATS, CdATS	1700 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1700 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	26.5	mi/h
Percent time-spent-following, PTSFd (from above)	85.3	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 953.3
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 6.20
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Volvo Car Drive (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	6.0 ft	% Trucks and buses	10 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	20 %
Up/down	- %	Access point density	8 /mi

Analysis direction volume, Vd 433 veh/h
Opposing direction volume, Vo 779 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.2	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.980	0.990
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	480 pc/h	855 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 0.0 mi/h
Adj. for access point density,(note-3) fA 2.0 mi/h

Free-flow speed, FFSd	48.0	mi/h
Adjustment for no-passing zones, fnp	0.4	mi/h
Average travel speed, ATSD	37.3	mi/h
Percent Free Flow Speed, PFFS	77.7	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	471 pc/h	847 pc/h
Base percent time-spent-following,(note-4) BPTSFd	53.7	%
Adjustment for no-passing zones, fnp	18.3	
Percent time-spent-following, PTSFd	60.2	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.28
Peak 15-min vehicle-miles of travel, VMT15	118 veh-mi
Peak-hour vehicle-miles of travel, VMT60	433 veh-mi
Peak 15-min total travel time, TT15	3.2 veh-h
Capacity from ATS, CdATS	1683 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1683 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	37.3	mi/h
Percent time-spent-following, PTSFd (from above)	60.2	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 470.7
Effective width of outside lane, We 24.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.06
Bicycle LOS E

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 27 (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	7 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	30 /mi

Analysis direction volume, Vd 597 veh/h
Opposing direction volume, Vo 769 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.993	1.000
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	668 pc/h	854 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 7.5 mi/h

Free-flow speed, FFSd	43.3	mi/h
Adjustment for no-passing zones, fnp	1.2	mi/h
Average travel speed, ATSD	30.3	mi/h
Percent Free Flow Speed, PFFS	70.0	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	663 pc/h	854 pc/h
Base percent time-spent-following,(note-4) BPTSFd	64.1	%
Adjustment for no-passing zones, fnp	25.8	
Percent time-spent-following, PTSFd	75.4	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.39
Peak 15-min vehicle-miles of travel, VMT15	166 veh-mi
Peak-hour vehicle-miles of travel, VMT60	597 veh-mi
Peak 15-min total travel time, TT15	5.5 veh-h
Capacity from ATS, CdATS	1700 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1700 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	30.3	mi/h
Percent time-spent-following, PTSFd (from above)	75.4	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 663.3
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 6.15
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 27 (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	10 /mi

Analysis direction volume, Vd 547 veh/h
Opposing direction volume, Vo 667 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.993	0.993
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	612 pc/h	746 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 2.5 mi/h

Free-flow speed, FFSd	49.5	mi/h
Adjustment for no-passing zones, fnp	1.5	mi/h
Average travel speed, ATSD	37.5	mi/h
Percent Free Flow Speed, PFFS	75.8	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	608 pc/h	741 pc/h
Base percent time-spent-following,(note-4) BPTSFd	60.0	%
Adjustment for no-passing zones, fnp	29.3	
Percent time-spent-following, PTSFd	73.2	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.36
Peak 15-min vehicle-miles of travel, VMT15	152 veh-mi
Peak-hour vehicle-miles of travel, VMT60	547 veh-mi
Peak 15-min total travel time, TT15	4.1 veh-h
Capacity from ATS, CdATS	1688 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1688 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	37.5	mi/h
Percent time-spent-following, PTSFd (from above)	73.2	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 607.8
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.97
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 453 (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	24 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	75 %
Up/down	- %	Access point density	4 /mi

Analysis direction volume, Vd 186 veh/h
Opposing direction volume, Vo 214 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.5	1.5
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.893	0.893
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	231 pc/h	266 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.7 mi/h
Adj. for access point density,(note-3) fA 1.0 mi/h

Free-flow speed, FFSd	39.3	mi/h
Adjustment for no-passing zones, fnp	3.2	mi/h
Average travel speed, ATSD	32.2	mi/h
Percent Free Flow Speed, PFFS	82.0	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.977	0.977
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	212 pc/h	243 pc/h
Base percent time-spent-following,(note-4) BPTSFd	24.2	%
Adjustment for no-passing zones, fnp	58.5	
Percent time-spent-following, PTSFd	51.5	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.14
Peak 15-min vehicle-miles of travel, VMT15	52 veh-mi
Peak-hour vehicle-miles of travel, VMT60	186 veh-mi
Peak 15-min total travel time, TT15	1.6 veh-h
Capacity from ATS, CdATS	1518 veh/h
Capacity from PTSF, CdPTSF	1660 veh/h
Directional Capacity	1518 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.2	mi/h
Percent time-spent-following, PTSFd (from above)	51.5	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 206.7
Effective width of outside lane, We 12.50
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 14.44
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 453 (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	24 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	70 %
Up/down	- %	Access point density	16 /mi

Analysis direction volume, Vd 202 veh/h
Opposing direction volume, Vo 288 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.5	1.4
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.893	0.912
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	251 pc/h	351 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 4.0 mi/h

Free-flow speed, FFSd	36.8	mi/h
Adjustment for no-passing zones, fnp	2.5	mi/h
Average travel speed, ATSD	29.6	mi/h
Percent Free Flow Speed, PFFS	80.4	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.977	0.977
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	230 pc/h	328 pc/h
Base percent time-spent-following,(note-4) BPTSFd	27.2	%
Adjustment for no-passing zones, fnp	52.9	
Percent time-spent-following, PTSFd	49.0	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.15
Peak 15-min vehicle-miles of travel, VMT15	56 veh-mi
Peak-hour vehicle-miles of travel, VMT60	202 veh-mi
Peak 15-min total travel time, TT15	1.9 veh-h
Capacity from ATS, CdATS	1550 veh/h
Capacity from PTSF, CdPTSF	1660 veh/h
Directional Capacity	1550 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	29.6	mi/h
Percent time-spent-following, PTSFd (from above)	49.0	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 224.4
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 14.42
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Jedburg Road (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.95
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 521 veh/h
Opposing direction volume, Vo 718 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.2	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.986	0.993
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	556 pc/h	761 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	1.3	mi/h
Average travel speed, ATSD	32.0	mi/h
Percent Free Flow Speed, PFFS	73.5	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	548 pc/h	756 pc/h
Base percent time-spent-following,(note-4) BPTSFd	57.0	%
Adjustment for no-passing zones, fnp	29.9	
Percent time-spent-following, PTSFd	69.6	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.33
Peak 15-min vehicle-miles of travel, VMT15	137 veh-mi
Peak-hour vehicle-miles of travel, VMT60	521 veh-mi
Peak 15-min total travel time, TT15	4.3 veh-h
Capacity from ATS, CdATS	1688 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1688 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.0	mi/h
Percent time-spent-following, PTSFd (from above)	69.6	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 548.4
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.92
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Jedburg Road (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	60 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 1069 veh/h
Opposing direction volume, Vo 877 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	1.000	1.000
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	1162 pc/h	953 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	0.6	mi/h
Average travel speed, ATSD	26.4	mi/h
Percent Free Flow Speed, PFFS	60.8	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	1162 pc/h	953 pc/h
Base percent time-spent-following,(note-4) BPTSFd	81.4	%
Adjustment for no-passing zones, fnp	15.3	
Percent time-spent-following, PTSFd	89.8	%

Level of Service and Other Performance Measures

Level of service, LOS	E
Volume to capacity ratio, v/c	0.68
Peak 15-min vehicle-miles of travel, VMT15	290 veh-mi
Peak-hour vehicle-miles of travel, VMT60	1069 veh-mi
Peak 15-min total travel time, TT15	11.0 veh-h
Capacity from ATS, CdATS	1700 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1700 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	26.4	mi/h
Percent time-spent-following, PTSFd (from above)	89.8	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 1162.0
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 6.30
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Volvo Car Drive (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	6.0 ft	% Trucks and buses	10 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	20 %
Up/down	- %	Access point density	8 /mi

Analysis direction volume, Vd 779 veh/h
Opposing direction volume, Vo 433 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.2
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.990	0.980
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	855 pc/h	480 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 0.0 mi/h
Adj. for access point density,(note-3) fA 2.0 mi/h

Free-flow speed, FFSd	48.0	mi/h
Adjustment for no-passing zones, fnp	0.8	mi/h
Average travel speed, ATSD	36.8	mi/h
Percent Free Flow Speed, PFFS	76.7	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	847 pc/h	471 pc/h
Base percent time-spent-following,(note-4) BPTSFd	68.4	%
Adjustment for no-passing zones, fnp	18.3	
Percent time-spent-following, PTSFd	80.2	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.50
Peak 15-min vehicle-miles of travel, VMT15	212 veh-mi
Peak-hour vehicle-miles of travel, VMT60	779 veh-mi
Peak 15-min total travel time, TT15	5.8 veh-h
Capacity from ATS, CdATS	1666 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1666 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	36.8	mi/h
Percent time-spent-following, PTSFd (from above)	80.2	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 846.7
Effective width of outside lane, We 24.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.36
Bicycle LOS E

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 27 (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	7 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	30 /mi

Analysis direction volume, Vd 769 veh/h
Opposing direction volume, Vo 597 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	1.000	0.993
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	854 pc/h	668 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 7.5 mi/h

Free-flow speed, FFSd	43.3	mi/h
Adjustment for no-passing zones, fnp	1.6	mi/h
Average travel speed, ATSD	29.9	mi/h
Percent Free Flow Speed, PFFS	69.0	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	854 pc/h	663 pc/h
Base percent time-spent-following,(note-4) BPTSFd	70.2	%
Adjustment for no-passing zones, fnp	25.8	
Percent time-spent-following, PTSFd	84.7	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.50
Peak 15-min vehicle-miles of travel, VMT15	214 veh-mi
Peak-hour vehicle-miles of travel, VMT60	769 veh-mi
Peak 15-min total travel time, TT15	7.2 veh-h
Capacity from ATS, CdATS	1688 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1688 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	29.9	mi/h
Percent time-spent-following, PTSFd (from above)	84.7	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 854.4
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 6.27
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 27 (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	10 /mi

Analysis direction volume, Vd 667 veh/h
Opposing direction volume, Vo 547 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.993	0.993
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	746 pc/h	612 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 2.5 mi/h

Free-flow speed, FFSd	49.5	mi/h
Adjustment for no-passing zones, fnp	1.9	mi/h
Average travel speed, ATSD	37.1	mi/h
Percent Free Flow Speed, PFFS	75.0	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	741 pc/h	608 pc/h
Base percent time-spent-following,(note-4) BPTSFd	64.3	%
Adjustment for no-passing zones, fnp	29.3	
Percent time-spent-following, PTSFd	80.4	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.44
Peak 15-min vehicle-miles of travel, VMT15	185 veh-mi
Peak-hour vehicle-miles of travel, VMT60	667 veh-mi
Peak 15-min total travel time, TT15	5.0 veh-h
Capacity from ATS, CdATS	1688 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1688 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	37.1	mi/h
Percent time-spent-following, PTSFd (from above)	80.4	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 741.1
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 6.07
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 453 (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	24 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	75 %
Up/down	- %	Access point density	4 /mi

Analysis direction volume, Vd 214 veh/h
Opposing direction volume, Vo 186 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.5	1.5
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.893	0.893
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	266 pc/h	231 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.7 mi/h
Adj. for access point density,(note-3) fA 1.0 mi/h

Free-flow speed, FFSd	39.3	mi/h
Adjustment for no-passing zones, fnp	3.4	mi/h
Average travel speed, ATSD	32.0	mi/h
Percent Free Flow Speed, PFFS	81.5	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.977	0.977
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	243 pc/h	212 pc/h
Base percent time-spent-following,(note-4) BPTSFd	25.1	%
Adjustment for no-passing zones, fnp	58.5	
Percent time-spent-following, PTSFd	56.3	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.16
Peak 15-min vehicle-miles of travel, VMT15	59 veh-mi
Peak-hour vehicle-miles of travel, VMT60	214 veh-mi
Peak 15-min total travel time, TT15	1.8 veh-h
Capacity from ATS, CdATS	1518 veh/h
Capacity from PTSF, CdPTSF	1660 veh/h
Directional Capacity	1518 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.0	mi/h
Percent time-spent-following, PTSFd (from above)	56.3	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 237.8
Effective width of outside lane, We 12.50
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 14.51
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
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Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 453 (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	24 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	70 %
Up/down	- %	Access point density	16 /mi

Analysis direction volume, Vd 288 veh/h
Opposing direction volume, Vo 202 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.4	1.5
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.912	0.893
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	351 pc/h	251 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 4.0 mi/h

Free-flow speed, FFSd 36.8 mi/h

Adjustment for no-passing zones, fnp 3.1 mi/h

Average travel speed, ATSD 29.0 mi/h

Percent Free Flow Speed, PFFS 78.8 %

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.977	0.977
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	328 pc/h	230 pc/h
Base percent time-spent-following,(note-4) BPTSFd	33.1 %	
Adjustment for no-passing zones, fnp	52.9	
Percent time-spent-following, PTSFd	64.2 %	

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.21
Peak 15-min vehicle-miles of travel, VMT15	80 veh-mi
Peak-hour vehicle-miles of travel, VMT60	288 veh-mi
Peak 15-min total travel time, TT15	2.8 veh-h
Capacity from ATS, CdATS	1518 veh/h
Capacity from PTSF, CdPTSF	1660 veh/h
Directional Capacity	1518 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0 mi
Length of two-lane highway upstream of the passing lane, Lu	- mi
Length of passing lane including tapers, Lpl	- mi
Average travel speed, ATSD (from above)	29.0 mi/h
Percent time-spent-following, PTSFd (from above)	64.2
Level of service, LOSd (from above)	C

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	- mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	- mi
Adj. factor for the effect of passing lane on average speed, fpl	-
Average travel speed including passing lane, ATSpl	-
Percent free flow speed including passing lane, PFFSpl	0.0 %

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 320.0
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 14.60
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

June 2019

C.10 2023 BUILD – ALTERNATIVE 4



HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1525	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	55	vph
Length of first accel/decel lane	465	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	142	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
	Ramp			
Volume, V (vph)	1525	55	142	vph
Peak-hour factor, PHF	0.91	0.95	0.90	

Peak 15-min volume, v_{15}	419	14	39	v
Trucks and buses	24	53	36	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.791	0.847	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	1877	73	186	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 1877$ pc/h

$v_{12} = 1877$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	1877	4800	No
$v_{12} = v_F$			
$v_{12} = v_F - v_R$	1804	4800	No
$v_{12} = v_F - v_R$			
$v_{12} = v_F$	73	2000	No
$v_{12} = v_F$			
$v_{12} = v_F$ or $v_{12} = v_R$	0 pc/h	(Equation 13-14 or 13-17)	
$v_{12} = v_F$ or $v_{12} = v_R$			
Is $v_{12} = v_F$ or $v_{12} = v_R$ > 2700 pc/h?		No	
Is $v_{12} = v_F$ or $v_{12} = v_R$ > 1.5 $v_{12} / 2$		No	
If yes, $v_{12} = 1877$		(Equation 13-15, 13-16, 13-18, or 13-19)	
$v_{12} = 1877$			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1877	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 16.2$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.435$

S

Space mean speed in ramp influence area, $S = 57.8$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 57.8 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1612	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	119	vph
Length of first accel/decel lane	250	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	507	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2300	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
	Ramp			
Volume, V (vph)	1612	119	507	vph
Peak-hour factor, PHF	0.91	0.90	0.90	

Peak 15-min volume, v_{15}	443	33	141	v
Trucks and buses	24	23	16	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.897	0.926	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	1984	147	608	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.704$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 1440$ pc/h

$v_{12} = 1440$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	1984	7200	No
$v_{12} = v_F$			
$v_{12} = v_F - v_R$	1837	7200	No
$v_{12} = v_F - v_R$			
$v_{12} = v_R$	147	2000	No
$v_{12} = v_R$			
$v_{12} = v_F$ or $v_{12} = v_R$	544 pc/h	(Equation 13-14 or 13-17)	
$v_{12} = v_F$ or $v_{12} = v_R$			
Is $v_{12} = v_F$ or $v_{12} = v_R$ > 2700 pc/h?		No	
Is $v_{12} = v_F$ or $v_{12} = v_R$ > 1.5 $v_{12} / 2$		No	
If yes, $v_{12} = 1440$	(Equation 13-15, 13-16, 13-18, or 13-19)		
$v_{12} = 1440$			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1440	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 14.4$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.441$

S

Space mean speed in ramp influence area, $S = 57.6$ mph

R

Space mean speed in outer lanes, S = 76.8 mph

0

Space mean speed for all vehicles, S = 61.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2000	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	98	vph
Length of first accel/decel lane	1200	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	89	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	3500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2000	98	89	vph
Peak-hour factor, PHF	0.91	0.92	0.92	

Peak 15-min volume, v ₁₅	549	27	24	v
Trucks and buses	24	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.893	0.952	0.952	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	2462	112	102	pcph

Estimation of V₁₂ Diverge Areas

L = (Equation 13-12 or 13-13)

EQ

P = 0.693 Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 1741$ pc/h

12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
v = v Fi F	2462	7200	No
v = v - v FO F R	2350	7200	No
v R	112	2000	No
v or v 3 av34	721 pc/h	(Equation 13-14 or 13-17)	
Is v or v 3 av34	> 2700 pc/h?	No	
Is v or v 3 av34	> 1.5 v /2	No	
	12		
If yes, v = 1741 12A		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1741	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 8.4$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable, $D = 0.438$

S

Space mean speed in ramp influence area, $S = 57.7$ mph

R

Space mean speed in outer lanes, S = 76.8 mph

0

Space mean speed for all vehicles, S = 62.3 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1991	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	145	vph
Length of first accel/decel lane	180	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	864	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2900	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1991	145	864	vph
Peak-hour factor, PHF	0.91	0.90	0.90	

Peak 15-min volume, v_{15}	547	40	240	v
Trucks and buses	24	29	11	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.873	0.948	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2450	184	1013	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.690$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 1748$ pc/h

$v_{12} = 1748$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	2450	7200	No
$v_{12} = v_F + (v_R - v_F) P$	2266	7200	No
$v_{12} = v_R$	184	2000	No
$v_{12} = v_F$ or $v_{12} = v_R$	702 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} > 2700$ pc/h?		No	
Is $v_{12} > 1.5 v_F / 2$		No	
If yes, $v_{12} = 1748$	(Equation 13-15, 13-16, 13-18, or 13-19)		

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1748	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 17.7$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.445$

S

Space mean speed in ramp influence area, $S = 57.6$ mph

R

Space mean speed in outer lanes, S = 76.8 mph

0

Space mean speed for all vehicles, S = 62.0 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2750	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	316	vph
Length of first accel/decel lane	850	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	151	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	750	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2750	316	151	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v_{15}	747	88	42	v
Trucks and buses	22	10	11	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.952	0.948	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3318	369	177	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.660$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 2316$ pc/h

$v_{12} = 2316$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	3318	7200	No
$v_{12} = v_F - v_R$	2949	7200	No
$v_{12} = v_F$	369	2000	No
v_{12} or v_{12}	1002 pc/h	(Equation 13-14 or 13-17)	
Is v_{12} or $v_{12} > 2700$ pc/h?	No		
Is v_{12} or $v_{12} > 1.5 v_{12} / 2$	No		
If yes, $v_{12} = 2316$	(Equation 13-15, 13-16, 13-18, or 13-19)		

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2316	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 16.5$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.461$

S

Space mean speed in ramp influence area, $S = 57.1$ mph

R

Space mean speed in outer lanes, S = 76.8 mph

0

Space mean speed for all vehicles, S = 61.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2902	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	152	vph
Length of first accel/decel lane	150	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	316	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	920	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2902	152	316	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v_{15}	789	42	88	v
Trucks and buses	22	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3501	177	369	pcph

Estimation of V12 Diverge Areas

$$L = 379.52 \text{ (Equation 13-12 or 13-13)}$$

EQ

$$P = 0.664 \text{ Using Equation 5}$$

FD

$$v_{12} = v_F + (v_R - v_F) P = 2385 \text{ pc/h}$$

12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	3501	7200	No
$v_{12} = v_F - v_R$	3324	7200	No
$v_{12} = v_F$	177	2000	No
$v_{12} \text{ or } v_{12}$	1116 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_{12} > 2700 \text{ pc/h?}$		No	
Is $v_{12} \text{ or } v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 2385$	(Equation 13-15, 13-16, 13-18, or 13-19)		
12A			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2385	4400	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L = 23.4 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

$$\text{Intermediate speed variable, } D = 0.444$$

S

$$\text{Space mean speed in ramp influence area, } S = 57.6 \text{ mph}$$

R

Space mean speed in outer lanes, S = 76.3 mph

0

Space mean speed for all vehicles, S = 62.5 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2585	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	394	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane	1500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	23	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2585	394	23	vph
Peak-hour factor, PHF	0.92	0.92	0.92	

Peak 15-min volume, v ₁₅	702	107	6	v
Trucks and buses	22	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.901	0.952	0.952	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	3119	450	26	pcph

Estimation of V12 Diverge Areas

L = (Equation 13-12 or 13-13)

EQ

P = 0.450 Using Equation 0

FD

$v_{12R} = v_F + (v - v_F) P = 1651$ pc/h

12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12R} = v_F$	3119	7200	No
$v_{12R} = v_F - v_{12R}$	2669	7200	No
v_{12R}	450	4000	No
v_{12R} or v_{12R}	1468 pc/h	(Equation 13-14 or 13-17)	
Is v_{12R} or $v_{12R} > 2700$ pc/h?		No	
Is v_{12R} or $v_{12R} > 1.5 v_{12R} / 2$		Yes	
If yes, $v_{12A} = 1782$	(Equation 13-15, 13-16, 13-18, or 13-19)		
12A			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	1782	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12R} - 0.009 L = -20.9$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable, $D = 0.469$

S

Space mean speed in ramp influence area, $S = 56.9$ mph

R

Space mean speed in outer lanes, S = 75.5 mph

0

Space mean speed for all vehicles, S = 63.6 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2214	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	376	vph
Length of first accel/decel lane	250	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	117	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2214	376	117	vph
Peak-hour factor, PHF	0.92	0.94	0.90	

Peak 15-min volume, v_{15}	602	100	33	v
Trucks and buses	22	25	16	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.889	0.926	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2671	450	140	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.673$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 1944$ pc/h

$v_{12} = 1944$

Capacity Checks

	Actual	Maximum	LOS F?
v = v Fi F	2671	7200	No
v = v - v FO F R	2221	7200	No
v R	450	2000	No
v or v 3 av34	727 pc/h	(Equation 13-14 or 13-17)	
Is v or v 3 av34	> 2700 pc/h?	No	
Is v or v 3 av34	> 1.5 v /2	No	
If yes, v = 1944 12A	(Equation 13-15, 13-16, 13-18, or 13-19)		

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1944	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 18.7$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.469$

S

Space mean speed in ramp influence area, $S = 56.9$ mph

R

Space mean speed in outer lanes, S = 76.8 mph

0

Space mean speed for all vehicles, S = 61.2 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1955	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	161	vph
Length of first accel/decel lane	475	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	54	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1955	161	54	vph
Peak-hour factor, PHF	0.92	0.90	0.92	

Peak 15-min volume, v_{15}	531	45	15	v
Trucks and buses	22	46	36	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.813	0.847	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2359	220	69	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 2359$ pc/h

$v_{12} = 2359$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	2359	4800	No
$v_{12} = v_F - v_R$	2139	4800	No
$v_{12} = v_F + v_R$	220	2000	No
$v_{12} = v_F$ or $v_{12} = v_F + v_R$	0 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} > 2700$ pc/h?		No	
Is $v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 2359$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2359	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 20.3$ pc/mi/ln

$D = 20.3$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.448$

S

Space mean speed in ramp influence area, $S = 57.5$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 57.5 mph

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: West of SC 453
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1525	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	419	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	938	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.2	mi/h
Free-flow speed, FFS	72.2	mi/h

LOS and Performance Measures

Flow rate, vp	938	pc/h/ln
Free-flow speed, FFS	72.2	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	2	
Density, D	13.4	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Between SC 453 Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1470	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	404	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	905	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.33	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.3	mi/h
Free-flow speed, FFS	74.1	mi/h

LOS and Performance Measures

Flow rate, vp	905	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	2	
Density, D	12.1	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: SC 453 to SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1612	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	443	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	992	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	992	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	2	
Density, D	13.2	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Between SC 27 Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1493	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	410	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	613	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, v_p	613	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	8.2	pc/mi/ln
Level of service, LOS	A	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Between SC 27 & Volvo
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2000	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	549	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	821	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	821	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	10.9	pc/mi/ln
Level of service, LOS	A	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Between Volvo Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1902	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	523	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	780	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	780	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	10.4	pc/mi/ln
Level of service, LOS	A	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Volvo to Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1991	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	547	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	817	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	817	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	10.9	pc/mi/ln
Level of service, LOS	A	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1846	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	507	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	757	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.50	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.8	mi/h
Free-flow speed, FFS	73.6	mi/h

LOS and Performance Measures

Flow rate, vp	757	pc/h/ln
Free-flow speed, FFS	73.6	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	10.1	pc/mi/ln
Level of service, LOS	A	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Jedburg to Nexton
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2710	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	745	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	1112	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.20	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.8	mi/h
Free-flow speed, FFS	71.6	mi/h

LOS and Performance Measures

Flow rate, vp	1112	pc/h/ln
Free-flow speed, FFS	71.6	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	3	
Density, D	15.9	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Nexton to Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2902	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	789	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1167	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.33	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	4.1	mi/h
Free-flow speed, FFS	71.3	mi/h

LOS and Performance Measures

Flow rate, vp	1167	pc/h/ln
Free-flow speed, FFS	71.3	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	3	
Density, D	16.7	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2434	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	661	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	979	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	979	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	13.1	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2750	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	747	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1106	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1106	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	74.9	mi/h
Number of lanes, N	3	
Density, D	14.8	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Jeddburg to Volvo
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2585	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	702	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1040	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	1040	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	13.9	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between Volvo Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2191	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	595	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	881	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, v_p	881	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	11.7	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between Volvo & SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2214	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	602	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	890	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	890	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	11.9	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between SC 27 Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1838	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	499	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	739	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	739	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	9.9	pc/mi/ln
Level of service, LOS	A	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: SC 27 to SC 453
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1955	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	531	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1179	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	1179	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	74.6	mi/h
Number of lanes, N	2	
Density, D	15.8	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between SC 453 Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1794	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	487	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1082	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.33	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.3	mi/h
Free-flow speed, FFS	74.1	mi/h

LOS and Performance Measures

Flow rate, vp	1082	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	74.9	mi/h
Number of lanes, N	2	
Density, D	14.4	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: West of SC 453
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1898	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	516	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1145	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.2	mi/h
Free-flow speed, FFS	72.2	mi/h

LOS and Performance Measures

Flow rate, vp	1145	pc/h/ln
Free-flow speed, FFS	72.2	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	2	
Density, D	16.4	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1470	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	142	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	55	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1470	142	55	vph
Peak-hour factor, PHF	0.91	0.90	0.95	

Peak 15-min volume, v_{15}	404	39	14	v
Trucks and buses	24	36	53	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.847	0.791	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	1809	186	73	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)

EQ

$P = 1.000$ Using Equation 0

FM

$v_{12} = v_{15} (P_{FM}) = 1809 \text{ pc/h}$

12 F FM

Capacity Checks

v_{12} Actual 1995 Maximum 4800 LOS F? No

FO

v_{12} or v_{15} 0 pc/h (Equation 13-14 or 13-17)

3 av34

Is v_{12} or $v_{15} > 2700 \text{ pc/h}$? No

3 av34

Is v_{12} or $v_{15} > 1.5 v_{12} / 2$? No

3 av34 12

If yes, $v_{12} = 1809$ (Equation 13-15, 13-16, 13-18, or 13-19)

12A

Flow Entering Merge Influence Area

v_{12} Actual 1995 Max Desirable 4600 Violation? No

R12

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_{12} + 0.0078 v_{15} - 0.00627 L = 15.9 \text{ pc/mi/ln}$

R R 12 A

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.294$

S

Space mean speed in ramp influence area, $S_R = 61.8 \text{ mph}$

R

Space mean speed in outer lanes, $S_O = \text{N/A} \text{ mph}$

0

Space mean speed for all vehicles, $S = 61.8 \text{ mph}$

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1493	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	507	vph
Length of first accel/decel lane	900	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	119	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2300	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
	Ramp			
Volume, V (vph)	1493	507	119	vph
Peak-hour factor, PHF	0.91	0.90	0.90	

Peak 15-min volume, v_{15}	410	141	33	v
Trucks and buses	24	16	23	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.926	0.897	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	1838	608	147	pcph

Estimation of V12 Merge Areas

$$L = 351.24 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.603 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 1108 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	2446	7200	No
FO			
v_{12} or v_{12}	730 pc/h	(Equation 13-14 or 13-17)	
$\frac{v_{12}}{3}$ av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
$\frac{v_{12}}{3}$ av34			
Is v_{12} or v_{12}	> 1.5 $v_{12} / 2$	Yes	
$\frac{v_{12}}{3}$ av34	12		
If yes, v_{12}	= 1108	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1716	4600	No
12A			

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 12.9 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.280$

S

Space mean speed in ramp influence area, $S = 62.2$ mph

R

Space mean speed in outer lanes, $S = 69.2$ mph

0

Space mean speed for all vehicles, $S = 64.1$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1902	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-flow speed on ramp	35.0	mph
Volume on ramp	89	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane	1500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	98	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	3500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1902	89	98	vph
Peak-hour factor, PHF	0.91	0.92	0.92	

Peak 15-min volume, v ₁₅	523	24	27	v
Trucks and buses	24	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.893	0.952	0.952	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	2341	102	112	pcph

Estimation of V₁₂ Merge Areas

L = (Equation 13-6 or 13-7)

EQ

P = 0.555 Using Equation 0

FM

v = v_P = 1299 pc/h

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v	2443	7200	No
FO			
v or v ₃	1042 pc/h	(Equation 13-14 or 13-17)	
av ₃₄			
Is v or v ₃	> 2700 pc/h?	No	
av ₃₄			
Is v or v ₃	> 1.5 v ₁₂ / 2	Yes	
av ₃₄	12		
If yes, v _{12A}	= 1337	(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v _{12A}	1439	4600	No

Level of Service Determination (if not F)

Density, D = $5.475 + 0.00734 v_R + 0.0078 v_A - 0.00627 L$ = -11.6 pc/mi/ln

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable, M = 0.022

S

Space mean speed in ramp influence area, S = 69.4 mph

R

Space mean speed in outer lanes, S = 68.2 mph

0

Space mean speed for all vehicles, S = 68.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1846	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	864	vph
Length of first accel/decel lane	1120	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	145	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2900	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1846	864	145	vph
Peak-hour factor, PHF	0.91	0.90	0.90	

Peak 15-min volume, v_{15}	507	240	40	v
Trucks and buses	24	11	29	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.948	0.873	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2272	1013	184	pcph

Estimation of V12 Merge Areas

$$L = 628.47 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.609 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 1383 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	3285	7200	No
FO			
v_{12} or v_{12}	889 pc/h	(Equation 13-14 or 13-17)	
v_{12} or v_{12}			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
v_{12} or v_{12}			
Is v_{12} or v_{12}	> 1.5 v_{12} / 2	Yes	
v_{12} or v_{12}			
If yes, v_{12}	= 1383	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2396	4600	No
12A			

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 16.7 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

$$\text{Intermediate speed variable, } M = 0.285$$

S

$$\text{Space mean speed in ramp influence area, } S = 62.0 \text{ mph}$$

R

$$\text{Space mean speed in outer lanes, } S = 68.6 \text{ mph}$$

0

$$\text{Space mean speed for all vehicles, } S = 63.7 \text{ mph}$$

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2434	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	151	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	316	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	750	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
	Ramp			
Volume, V (vph)	2434	151	316	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v ₁₅	661	42	88	v
Trucks and buses	22	11	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.901	0.948	0.952	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	2937	177	369	pcph

Estimation of V₁₂ Merge Areas

$$L = 760.60 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.619 \text{ Using Equation 2}$$

FM

$$v_{12} = v_{12} (P) = 1817 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v	3114	7200	No
FO			
v or v ₃	1120 pc/h	(Equation 13-14 or 13-17)	
av ₃₄			
Is v or v ₃	> 2700 pc/h?	No	
av ₃₄			
Is v or v ₃	> 1.5 v ₁₂ / 2	Yes	
av ₃₄	12		
If yes, v _{12A}	= 1817	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v	1994	4600	No
12A			

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_R + 0.0078 v_A - 0.00627 L = 11.5 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, M = 0.245

S

Space mean speed in ramp influence area, S = 63.1 mph

R

Space mean speed in outer lanes, S = 67.8 mph

0

Space mean speed for all vehicles, S = 64.7 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2191	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	23	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	394	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2191	23	394	vph
Peak-hour factor, PHF	0.92	0.92	0.92	

Peak 15-min volume, v_{15}	595	6	107	v
Trucks and buses	22	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2643	26	450	pcph

Estimation of V12 Merge Areas

$$L = 665.37 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.619 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 1637 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	2669	7200	No
FO			
v_{12} or v_{12}	1006 pc/h	(Equation 13-14 or 13-17)	
$\frac{v_{12}}{3}$ av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
$\frac{v_{12}}{3}$ av34			
Is v_{12} or v_{12}	> 1.5 $v_{12} / 2$	Yes	
$\frac{v_{12}}{3}$ av34	12		
If yes, v_{12}	= 1637	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1663	4600	No
12A			

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 9.0 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

$$\text{Intermediate speed variable, } M = 0.237$$

S

$$\text{Space mean speed in ramp influence area, } S_R = 63.4 \text{ mph}$$

R

$$\text{Space mean speed in outer lanes, } S_O = 68.2 \text{ mph}$$

0

$$\text{Space mean speed for all vehicles, } S_A = 65.1 \text{ mph}$$

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1838	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	117	vph
Length of first accel/decel lane	900	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	376	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1838	117	376	vph
Peak-hour factor, PHF	0.92	0.90	0.94	

Peak 15-min volume, v ₁₅	499	33	100	v
Trucks and buses	22	16	25	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.901	0.926	0.889	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	2218	140	450	pcph

Estimation of V₁₂ Merge Areas

$$L = 332.41 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.603 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 1337 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v	2358	7200	No
FO			
v or v ₃	881 pc/h	(Equation 13-14 or 13-17)	
av ₃₄			
Is v or v ₃	> 2700 pc/h?	No	
av ₃₄			
Is v or v ₃	> 1.5 v ₁₂ / 2	Yes	
av ₃₄	12		
If yes, v _{12A}	= 1337	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v	1477	4600	No
12A			

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_R + 0.0078 v_A - 0.00627 L = 11.3 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

$$\text{Intermediate speed variable, } M = 0.275$$

S

$$\text{Space mean speed in ramp influence area, } S_R = 62.3 \text{ mph}$$

R

$$\text{Space mean speed in outer lanes, } S_0 = 68.6 \text{ mph}$$

0

$$\text{Space mean speed for all vehicles, } S = 64.5 \text{ mph}$$

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1794	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	54	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	161	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1794	54	161	vph
Peak-hour factor, PHF	0.92	0.92	0.90	

Peak 15-min volume, v ₁₅	487	15	45	v
Trucks and buses	22	36	46	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.901	0.847	0.813	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	2164	69	220	pcph

Estimation of V12 Merge Areas

L = (Equation 13-6 or 13-7)

EQ

P = 1.000 Using Equation 0

FM

v = v₁₂ (P) = 2164 pc/h

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v	2233	4800	No
FO			
v or v ₃	0 pc/h	(Equation 13-14 or 13-17)	
av ₃₄			
Is v or v ₃	> 2700 pc/h?	No	
av ₃₄			
Is v or v ₃	> 1.5 v ₁₂ / 2	No	
av ₃₄	12		
If yes, v _{12A}	= 2164	(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v	2233	4600	No
R12			

Level of Service Determination (if not F)

Density, D = $5.475 + 0.00734 v_R + 0.0078 v_A - 0.00627 L$ = 17.8 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, M = 0.301

S

Space mean speed in ramp influence area, S = 61.6 mph

R

Space mean speed in outer lanes, S = N/A mph

0

Space mean speed for all vehicles, S = 61.6 mph

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Jedburg Road (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.93
Shoulder width	2.5 ft	% Trucks and buses	11 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 352 veh/h
Opposing direction volume, Vo 562 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.3	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.968	0.989
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	391 pc/h	611 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	1.8	mi/h
Average travel speed, ATSD	34.0	mi/h
Percent Free Flow Speed, PFFS	78.1	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.989	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	383 pc/h	604 pc/h
Base percent time-spent-following,(note-4) BPTSFd	44.0	%
Adjustment for no-passing zones, fnp	36.1	
Percent time-spent-following, PTSFd	58.0	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.23
Peak 15-min vehicle-miles of travel, VMT15	95 veh-mi
Peak-hour vehicle-miles of travel, VMT60	352 veh-mi
Peak 15-min total travel time, TT15	2.8 veh-h
Capacity from ATS, CdATS	1681 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1681 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	34.0	mi/h
Percent time-spent-following, PTSFd (from above)	58.0	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 378.5
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 7.27
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Jedburg Road (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.94
Shoulder width	2.5 ft	% Trucks and buses	11 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	60 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 777 veh/h
Opposing direction volume, Vo 535 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.989	0.989
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	836 pc/h	575 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	1.4	mi/h
Average travel speed, ATSD	31.2	mi/h
Percent Free Flow Speed, PFFS	71.6	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	827 pc/h	569 pc/h
Base percent time-spent-following,(note-4) BPTSFd	67.7	%
Adjustment for no-passing zones, fnp	25.6	
Percent time-spent-following, PTSFd	82.9	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.49
Peak 15-min vehicle-miles of travel, VMT15	207 veh-mi
Peak-hour vehicle-miles of travel, VMT60	777 veh-mi
Peak 15-min total travel time, TT15	6.6 veh-h
Capacity from ATS, CdATS	1681 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1681 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	31.2	mi/h
Percent time-spent-following, PTSFd (from above)	82.9	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 826.6
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 7.66
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Volvo Car Drive (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	6.0 ft	% Trucks and buses	10 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	20 %
Up/down	- %	Access point density	8 /mi

Analysis direction volume, Vd 492 veh/h
Opposing direction volume, Vo 112 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.2	1.8
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.980	0.926
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	546 pc/h	131 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 0.0 mi/h
Adj. for access point density,(note-3) fA 2.0 mi/h

Free-flow speed, FFSd	48.0	mi/h
Adjustment for no-passing zones, fnp	0.4	mi/h
Average travel speed, ATSD	42.3	mi/h
Percent Free Flow Speed, PFFS	88.1	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	0.990
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	535 pc/h	123 pc/h
Base percent time-spent-following,(note-4) BPTSFd	46.9	%
Adjustment for no-passing zones, fnp	21.6	
Percent time-spent-following, PTSFd	64.5	%

Level of Service and Other Performance Measures

Level of service, LOS	B
Volume to capacity ratio, v/c	0.32
Peak 15-min vehicle-miles of travel, VMT15	134 veh-mi
Peak-hour vehicle-miles of travel, VMT60	492 veh-mi
Peak 15-min total travel time, TT15	3.2 veh-h
Capacity from ATS, CdATS	1574 veh/h
Capacity from PTSF, CdPTSF	1683 veh/h
Directional Capacity	1574 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	42.3	mi/h
Percent time-spent-following, PTSFd (from above)	64.5	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 534.8
Effective width of outside lane, We 24.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.13
Bicycle LOS E

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 27 (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.93
Shoulder width	1.0 ft	% Trucks and buses	16 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	30 /mi

Analysis direction volume, Vd 415 veh/h
Opposing direction volume, Vo 379 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.3	1.3
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.954	0.954
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	468 pc/h	427 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 7.5 mi/h

Free-flow speed, FFSd	43.3	mi/h
Adjustment for no-passing zones, fnp	2.6	mi/h
Average travel speed, ATSD	33.8	mi/h
Percent Free Flow Speed, PFFS	78.0	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	446 pc/h	408 pc/h
Base percent time-spent-following,(note-4) BPTSFd	45.4	%
Adjustment for no-passing zones, fnp	43.9	
Percent time-spent-following, PTSFd	68.3	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.27
Peak 15-min vehicle-miles of travel, VMT15	112 veh-mi
Peak-hour vehicle-miles of travel, VMT60	415 veh-mi
Peak 15-min total travel time, TT15	3.3 veh-h
Capacity from ATS, CdATS	1622 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1622 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	33.8	mi/h
Percent time-spent-following, PTSFd (from above)	68.3	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 446.2
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 9.87
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 27 (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.91
Shoulder width	2.5 ft	% Trucks and buses	16 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	10 /mi

Analysis direction volume, Vd 526 veh/h
Opposing direction volume, Vo 363 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.3
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.984	0.954
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	587 pc/h	418 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 2.5 mi/h

Free-flow speed, FFSd	49.5	mi/h
Adjustment for no-passing zones, fnp	2.6	mi/h
Average travel speed, ATSD	39.1	mi/h
Percent Free Flow Speed, PFFS	78.9	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	0.984
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	578 pc/h	405 pc/h
Base percent time-spent-following,(note-4) BPTSFd	53.9	%
Adjustment for no-passing zones, fnp	37.4	
Percent time-spent-following, PTSFd	75.9	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.35
Peak 15-min vehicle-miles of travel, VMT15	145 veh-mi
Peak-hour vehicle-miles of travel, VMT60	526 veh-mi
Peak 15-min total travel time, TT15	3.7 veh-h
Capacity from ATS, CdATS	1622 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1622 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	39.1	mi/h
Percent time-spent-following, PTSFd (from above)	75.9	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 578.0
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 9.87
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 453 (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	1.0 ft	% Trucks and buses	36 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	75 %
Up/down	- %	Access point density	4 /mi

Analysis direction volume, Vd 196 veh/h
Opposing direction volume, Vo 127 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.5	1.7
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.847	0.799
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	252 pc/h	173 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.7 mi/h
Adj. for access point density,(note-3) fA 1.0 mi/h

Free-flow speed, FFSd	39.3	mi/h
Adjustment for no-passing zones, fnp	3.2	mi/h
Average travel speed, ATSD	32.8	mi/h
Percent Free Flow Speed, PFFS	83.4	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.965	0.965
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	221 pc/h	143 pc/h
Base percent time-spent-following,(note-4) BPTSFd	23.5	%
Adjustment for no-passing zones, fnp	53.7	
Percent time-spent-following, PTSFd	56.1	%

Level of Service and Other Performance Measures

Level of service, LOS	B
Volume to capacity ratio, v/c	0.15
Peak 15-min vehicle-miles of travel, VMT15	53 veh-mi
Peak-hour vehicle-miles of travel, VMT60	196 veh-mi
Peak 15-min total travel time, TT15	1.6 veh-h
Capacity from ATS, CdATS	1358 veh/h
Capacity from PTSF, CdPTSF	1641 veh/h
Directional Capacity	1358 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.8	mi/h
Percent time-spent-following, PTSFd (from above)	56.1	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 213.0
Effective width of outside lane, We 12.50
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 24.27
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 453 (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	36 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	70 %
Up/down	- %	Access point density	16 /mi

Analysis direction volume, Vd 190 veh/h
Opposing direction volume, Vo 159 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.5	1.6
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.847	0.822
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	249 pc/h	215 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 4.0 mi/h

Free-flow speed, FFSd	36.8	mi/h
Adjustment for no-passing zones, fnp	3.4	mi/h
Average travel speed, ATSD	29.8	mi/h
Percent Free Flow Speed, PFFS	81.1	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.965	0.965
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	219 pc/h	183 pc/h
Base percent time-spent-following,(note-4) BPTSFd	23.3	%
Adjustment for no-passing zones, fnp	58.9	
Percent time-spent-following, PTSFd	55.4	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.15
Peak 15-min vehicle-miles of travel, VMT15	53 veh-mi
Peak-hour vehicle-miles of travel, VMT60	190 veh-mi
Peak 15-min total travel time, TT15	1.8 veh-h
Capacity from ATS, CdATS	1397 veh/h
Capacity from PTSF, CdPTSF	1641 veh/h
Directional Capacity	1397 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	29.8	mi/h
Percent time-spent-following, PTSFd (from above)	55.4	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 211.1
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 24.20
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Jedburg Road (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.93
Shoulder width	2.5 ft	% Trucks and buses	11 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 562 veh/h
Opposing direction volume, Vo 352 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.3
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.989	0.968
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	611 pc/h	391 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	2.8	mi/h
Average travel speed, ATSD	33.0	mi/h
Percent Free Flow Speed, PFFS	75.8	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	0.989
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	604 pc/h	383 pc/h
Base percent time-spent-following,(note-4) BPTSFd	54.8	%
Adjustment for no-passing zones, fnp	36.1	
Percent time-spent-following, PTSFd	76.9	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.36
Peak 15-min vehicle-miles of travel, VMT15	151 veh-mi
Peak-hour vehicle-miles of travel, VMT60	562 veh-mi
Peak 15-min total travel time, TT15	4.6 veh-h
Capacity from ATS, CdATS	1646 veh/h
Capacity from PTSF, CdPTSF	1682 veh/h
Directional Capacity	1646 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	33.0	mi/h
Percent time-spent-following, PTSFd (from above)	76.9	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 604.3
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 7.50
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Jedburg Road (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.94
Shoulder width	2.5 ft	% Trucks and buses	11 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	60 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 535 veh/h
Opposing direction volume, Vo 777 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.989	0.989
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	575 pc/h	836 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	0.8	mi/h
Average travel speed, ATSD	31.8	mi/h
Percent Free Flow Speed, PFFS	73.1	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	569 pc/h	827 pc/h
Base percent time-spent-following,(note-4) BPTSFd	59.4	%
Adjustment for no-passing zones, fnp	25.6	
Percent time-spent-following, PTSFd	69.8	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.34
Peak 15-min vehicle-miles of travel, VMT15	142 veh-mi
Peak-hour vehicle-miles of travel, VMT60	535 veh-mi
Peak 15-min total travel time, TT15	4.5 veh-h
Capacity from ATS, CdATS	1681 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1681 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	31.8	mi/h
Percent time-spent-following, PTSFd (from above)	69.8	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 569.1
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 7.47
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Volvo Car Drive (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	6.0 ft	% Trucks and buses	10 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	20 %
Up/down	- %	Access point density	8 /mi

Analysis direction volume, Vd 112 veh/h
Opposing direction volume, Vo 492 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.8	1.2
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.926	0.980
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	131 pc/h	546 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 0.0 mi/h
Adj. for access point density,(note-3) fA 2.0 mi/h

Free-flow speed, FFSd	48.0	mi/h
Adjustment for no-passing zones, fnp	0.7	mi/h
Average travel speed, ATSD	42.1	mi/h
Percent Free Flow Speed, PFFS	87.7	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.990	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	123 pc/h	535 pc/h
Base percent time-spent-following,(note-4) BPTSFd	18.7	%
Adjustment for no-passing zones, fnp	21.6	
Percent time-spent-following, PTSFd	22.7	%

Level of Service and Other Performance Measures

Level of service, LOS	B
Volume to capacity ratio, v/c	0.08
Peak 15-min vehicle-miles of travel, VMT15	30 veh-mi
Peak-hour vehicle-miles of travel, VMT60	112 veh-mi
Peak 15-min total travel time, TT15	0.7 veh-h
Capacity from ATS, CdATS	1666 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1666 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	42.1	mi/h
Percent time-spent-following, PTSFd (from above)	22.7	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 121.7
Effective width of outside lane, We 31.92
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 2.16
Bicycle LOS B

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 27 (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.93
Shoulder width	1.0 ft	% Trucks and buses	16 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	30 /mi

Analysis direction volume, Vd 379 veh/h
Opposing direction volume, Vo 415 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.3	1.3
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.954	0.954
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	427 pc/h	468 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 7.5 mi/h

Free-flow speed, FFSd	43.3	mi/h
Adjustment for no-passing zones, fnp	2.4	mi/h
Average travel speed, ATSD	34.0	mi/h
Percent Free Flow Speed, PFFS	78.4	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	408 pc/h	446 pc/h
Base percent time-spent-following,(note-4) BPTSFd	45.0	%
Adjustment for no-passing zones, fnp	43.9	
Percent time-spent-following, PTSFd	66.0	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.25
Peak 15-min vehicle-miles of travel, VMT15	102 veh-mi
Peak-hour vehicle-miles of travel, VMT60	379 veh-mi
Peak 15-min total travel time, TT15	3.0 veh-h
Capacity from ATS, CdATS	1622 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1622 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	34.0	mi/h
Percent time-spent-following, PTSFd (from above)	66.0	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 407.5
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 9.83
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
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Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 27 (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.91
Shoulder width	2.5 ft	% Trucks and buses	16 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	10 /mi

Analysis direction volume, Vd 363 veh/h
Opposing direction volume, Vo 526 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.3	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.954	0.984
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	418 pc/h	587 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 2.5 mi/h

Free-flow speed, FFSd	49.5	mi/h
Adjustment for no-passing zones, fnp	1.9	mi/h
Average travel speed, ATSD	39.8	mi/h
Percent Free Flow Speed, PFFS	80.3	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.984	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	405 pc/h	578 pc/h
Base percent time-spent-following,(note-4) BPTSFd	46.0	%
Adjustment for no-passing zones, fnp	37.4	
Percent time-spent-following, PTSFd	61.4	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.25
Peak 15-min vehicle-miles of travel, VMT15	100 veh-mi
Peak-hour vehicle-miles of travel, VMT60	363 veh-mi
Peak 15-min total travel time, TT15	2.5 veh-h
Capacity from ATS, CdATS	1673 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1673 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	39.8	mi/h
Percent time-spent-following, PTSFd (from above)	61.4	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 398.9
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 9.68
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
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Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 453 (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	1.0 ft	% Trucks and buses	36 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	75 %
Up/down	- %	Access point density	4 /mi

Analysis direction volume, Vd 127 veh/h
Opposing direction volume, Vo 196 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.7	1.5
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.799	0.847
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	173 pc/h	252 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.7 mi/h
Adj. for access point density,(note-3) fA 1.0 mi/h

Free-flow speed, FFSd	39.3	mi/h
Adjustment for no-passing zones, fnp	3.3	mi/h
Average travel speed, ATSD	32.7	mi/h
Percent Free Flow Speed, PFFS	83.2	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.965	0.965
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	143 pc/h	221 pc/h
Base percent time-spent-following,(note-4) BPTSFd	16.7	%
Adjustment for no-passing zones, fnp	53.7	
Percent time-spent-following, PTSFd	37.8	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.10
Peak 15-min vehicle-miles of travel, VMT15	35 veh-mi
Peak-hour vehicle-miles of travel, VMT60	127 veh-mi
Peak 15-min total travel time, TT15	1.1 veh-h
Capacity from ATS, CdATS	1440 veh/h
Capacity from PTSF, CdPTSF	1641 veh/h
Directional Capacity	1440 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.7	mi/h
Percent time-spent-following, PTSFd (from above)	37.8	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 138.0
Effective width of outside lane, We 17.06
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 23.38
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
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Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 453 (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	36 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	70 %
Up/down	- %	Access point density	16 /mi

Analysis direction volume, Vd 159 veh/h
Opposing direction volume, Vo 190 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.6	1.5
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.822	0.847
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	215 pc/h	249 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 4.0 mi/h

Free-flow speed, FFSd	36.8	mi/h
Adjustment for no-passing zones, fnp	3.2	mi/h
Average travel speed, ATSD	30.0	mi/h
Percent Free Flow Speed, PFFS	81.6	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.965	0.965
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	183 pc/h	219 pc/h
Base percent time-spent-following,(note-4) BPTSFd	20.7	%
Adjustment for no-passing zones, fnp	58.9	
Percent time-spent-following, PTSFd	47.5	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.13
Peak 15-min vehicle-miles of travel, VMT15	44 veh-mi
Peak-hour vehicle-miles of travel, VMT60	159 veh-mi
Peak 15-min total travel time, TT15	1.5 veh-h
Capacity from ATS, CdATS	1440 veh/h
Capacity from PTSF, CdPTSF	1641 veh/h
Directional Capacity	1440 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	30.0	mi/h
Percent time-spent-following, PTSFd (from above)	47.5	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 176.7
Effective width of outside lane, We 15.66
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 23.73
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2010	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	31	vph
Length of first accel/decel lane	465	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	163	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2010	31	163	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v_{15}	546	9	45	v
Trucks and buses	10	52	24	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.794	0.893	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2294	43	203	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 2294$ pc/h

$v_{12} = 2294$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	2294	4800	No
$v_{12} = v_F - v_R$	2251	4800	No
$v_{12} = v_F$	43	2000	No
$v_{12} \text{ or } v_R$	0 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_R > 2700$ pc/h?		No	
Is $v_{12} \text{ or } v_R > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 2294$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2294	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 19.8$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.432$

S

Space mean speed in ramp influence area, $S = 57.9$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 57.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2142	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	135	vph
Length of first accel/decel lane	250	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	519	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2300	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2142	135	519	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v_{15}	582	38	144	v
Trucks and buses	10	8	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.962	0.966	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2445	156	597	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.692$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 1739$ pc/h

$v_{12} = 1739$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	2445	7200	No
$v_{12} = v_F - v_R$	2289	7200	No
$v_{12} = v_F$	156	2000	No
$v_{12} = v_F$	706 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} > 2700$ pc/h?	No		
Is $v_{12} > 1.5 v_{12} / 2$	No		
If yes, $v_{12} = 1739$	(Equation 13-15, 13-16, 13-18, or 13-19)		

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1739	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 17.0$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.442$

S

Space mean speed in ramp influence area, $S = 57.6$ mph

R

Space mean speed in outer lanes, S = 76.8 mph

0

Space mean speed for all vehicles, S = 62.1 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2526	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	31	vph
Length of first accel/decel lane	1200	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	378	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	3500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2526	31	378	vph
Peak-hour factor, PHF	0.92	0.92	0.92	

Peak 15-min volume, v ₁₅	686	8	103	v
Trucks and buses	10	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.952	0.952	0.952	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	2883	35	431	pcph

Estimation of V₁₂ Diverge Areas

L = (Equation 13-12 or 13-13)

EQ

P = 0.686 Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 1990$ pc/h

12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
v = v Fi F	2883	7200	No
v = v - v FO F R	2848	7200	No
v R	35	2000	No
v or v 3 av34	893 pc/h	(Equation 13-14 or 13-17)	
Is v or v 3 av34	> 2700 pc/h?	No	
Is v or v 3 av34	> 1.5 v /2	No	
If yes, v = 1990 12A		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1990	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 10.6$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.431$

S

Space mean speed in ramp influence area, $S = 57.9$ mph

R

Space mean speed in outer lanes, S = 76.8 mph

0

Space mean speed for all vehicles, S = 62.7 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2873	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	158	vph
Length of first accel/decel lane	180	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	644	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2900	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2873	158	644	vph
Peak-hour factor, PHF	0.92	0.91	0.90	

Peak 15-min volume, v ₁₅	781	43	179	v
Trucks and buses	10	19	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.952	0.913	0.966	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	3279	190	741	pcph

Estimation of V12 Diverge Areas

L = (Equation 13-12 or 13-13)

EQ

P = 0.669 Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 2257$ pc/h

12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
v = v Fi F	3279	7200	No
v = v - v FO F R	3089	7200	No
v R	190	2000	No
v or v 3 av34	1022 pc/h	(Equation 13-14 or 13-17)	
Is v or v 3 av34 > 2700 pc/h?		No	
Is v or v 3 av34 > 1.5 v /2		No	
If yes, v = 2257 12A		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2257	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 22.0$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.445$

S

Space mean speed in ramp influence area, $S = 57.5$ mph

R

Space mean speed in outer lanes, S = 76.7 mph

0

Space mean speed for all vehicles, S = 62.4 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3490	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	627	vph
Length of first accel/decel lane	850	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	155	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	750	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3490	627	155	vph
Peak-hour factor, PHF	0.93	0.95	0.90	

Peak 15-min volume, v_{15}	938	165	43	v
Trucks and buses	15	6	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.971	0.966	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	4034	680	178	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.628$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 2786$ pc/h

$v_{12} = 2786$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	4034	7200	No
$v_{12} = v_F - v_R$	3354	7200	No
$v_{12} = v_R$	680	2000	No
$v_{12} \text{ or } v_{12}$	1248 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_{12} > 2700$ pc/h?		No	
Is $v_{12} \text{ or } v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 2786$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2786	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 20.6$ pc/mi/ln

$D = 20.6$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.489$

S

Space mean speed in ramp influence area, $S = 56.3$ mph

R

Space mean speed in outer lanes, S = 75.8 mph

0

Space mean speed for all vehicles, S = 61.2 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3767	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	277	vph
Length of first accel/decel lane	150	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	627	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	920	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3767	277	627	vph
Peak-hour factor, PHF	0.93	0.95	0.95	

Peak 15-min volume, v_{15}	1013	73	165	v
Trucks and buses	15	6	6	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	4354	300	680	pcph

Estimation of V12 Diverge Areas

$$L = 755.98 \text{ (Equation 13-12 or 13-13)}$$

EQ

$$P = 0.637 \text{ Using Equation 5}$$

FD

$$v_{12} = v_F + (v_R - v_F) P = 2884 \text{ pc/h}$$

12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	4354	7200	No
$v_{12} = v_F - v_R$	4054	7200	No
$v_{12} = v_F$	300	2000	No
$v_{12} \text{ or } v_{12}$	1470 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_{12} > 2700 \text{ pc/h?}$		No	
Is $v_{12} \text{ or } v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 2884$	(Equation 13-15, 13-16, 13-18, or 13-19)		
12A			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2884	4400	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L = 27.7 \text{ pc/mi/ln}$$

R 12 D

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

$$\text{Intermediate speed variable, } D = 0.455$$

S

$$\text{Space mean speed in ramp influence area, } S = 57.3 \text{ mph}$$

R

Space mean speed in outer lanes, S = 75.0 mph

0

Space mean speed for all vehicles, S = 62.2 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3018	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	124	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane	1500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	94	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3018	124	94	vph
Peak-hour factor, PHF	0.93	0.92	0.92	

Peak 15-min volume, v ₁₅	811	34	26	v
Trucks and buses	15	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.930	0.952	0.952	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	3489	142	107	pcph

Estimation of V₁₂ Diverge Areas

L = (Equation 13-12 or 13-13)

EQ

P = 0.450 Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 1648$ pc/h

12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
v = v Fi F	3489	7200	No
v = v - v FO F R	3347	7200	No
v R	142	4000	No
v or v 3 av34	1841 pc/h	(Equation 13-14 or 13-17)	
Is v or v 3 av34	> 2700 pc/h?	No	
Is v or v 3 av34	> 1.5 v /2	Yes	
If yes, v = 1993 12A	(Equation 13-15, 13-16, 13-18, or 13-19)		

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1993	4400	No
12A			

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = -19.1$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable, $D = 0.441$

S

Space mean speed in ramp influence area, $S = 57.7$ mph

R

Space mean speed in outer lanes, S = 74.9 mph

0

Space mean speed for all vehicles, S = 64.0 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2988	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	508	vph
Length of first accel/decel lane	250	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	155	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2988	508	155	vph
Peak-hour factor, PHF	0.93	0.91	0.90	

Peak 15-min volume, v_{15}	803	140	43	v
Trucks and buses	15	7	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.966	0.966	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3454	578	178	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.647$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 2439$ pc/h

$v_{12} = 2439$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	3454	7200	No
$v_{12} = v_F - v_R$	2876	7200	No
$v_{12} = v_F$	578	2000	No
$v_{12} = v_F$	1015 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} > 2700$ pc/h?	No		
Is $v_{12} > 1.5 v_{12} / 2$	No		
If yes, $v_{12} = 2439$	(Equation 13-15, 13-16, 13-18, or 13-19)		

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2439	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 23.0$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.480$

S

Space mean speed in ramp influence area, $S = 56.6$ mph

R

Space mean speed in outer lanes, S = 76.7 mph

0

Space mean speed for all vehicles, S = 61.3 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2635	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	166	vph
Length of first accel/decel lane	475	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	57	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2635	166	57	vph
Peak-hour factor, PHF	0.93	0.90	0.90	

Peak 15-min volume, v_{15}	708	46	16	v
Trucks and buses	15	21	24	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.905	0.893	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3046	204	71	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 3046$ pc/h

$v_{12} = 3046$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	3046	4800	No
$v_{12} = v_F - v_R$	2842	4800	No
$v_{12} = v_F - v_R$	204	2000	No
$v_{12} = v_F$ or $v_{12} = v_F - v_R$	0 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} = v_F$ or $v_{12} = v_F - v_R$ > 2700 pc/h?		No	
Is $v_{12} = v_F$ or $v_{12} = v_F - v_R$ > 1.5 $v_{12} / 2$?		No	
If yes, $v_{12} = 3046$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3046	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 26.2$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.446$

S

Space mean speed in ramp influence area, $S = 57.5$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 57.5 mph

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: West of SC 453
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2010	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	546	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1147	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.2	mi/h
Free-flow speed, FFS	72.2	mi/h

LOS and Performance Measures

Flow rate, vp	1147	pc/h/ln
Free-flow speed, FFS	72.2	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	2	
Density, D	16.4	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Between SC 453 Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1979	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	538	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1129	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.33	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.3	mi/h
Free-flow speed, FFS	74.1	mi/h

LOS and Performance Measures

Flow rate, vp	1129	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	74.8	mi/h
Number of lanes, N	2	
Density, D	15.1	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: SC 453 to SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2142	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	582	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1222	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	1222	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	74.5	mi/h
Number of lanes, N	2	
Density, D	16.4	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Between SC 27 Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2007	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	545	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	764	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, v_p	764	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	10.2	pc/mi/ln
Level of service, LOS	A	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Between SC 27 & Volvo
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2526	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	686	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	961	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, v_p	961	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	12.8	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Between Volvo Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2495	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	678	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	949	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, v_p	949	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	12.7	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Volvo to Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2873	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	781	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1093	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1093	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	74.9	mi/h
Number of lanes, N	3	
Density, D	14.6	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2715	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	738	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1033	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.50	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.8	mi/h
Free-flow speed, FFS	73.6	mi/h

LOS and Performance Measures

Flow rate, vp	1033	pc/h/ln
Free-flow speed, FFS	73.6	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	13.8	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Jedburg to Nexton
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3359	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	913	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1278	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.20	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.8	mi/h
Free-flow speed, FFS	71.6	mi/h

LOS and Performance Measures

Flow rate, vp	1278	pc/h/ln
Free-flow speed, FFS	71.6	mi/h
Average passenger-car speed, S	69.9	mi/h
Number of lanes, N	3	
Density, D	18.3	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Nexton to Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3767	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	1013	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1451	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.33	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	4.1	mi/h
Free-flow speed, FFS	71.3	mi/h

LOS and Performance Measures

Flow rate, vp	1451	pc/h/ln
Free-flow speed, FFS	71.3	mi/h
Average passenger-car speed, S	69.3	mi/h
Number of lanes, N	3	
Density, D	20.9	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2863	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	770	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1103	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1103	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	74.9	mi/h
Number of lanes, N	3	
Density, D	14.7	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3490	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	938	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1345	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1345	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	73.7	mi/h
Number of lanes, N	3	
Density, D	18.3	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Jeddburg to Volvo
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3018	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	811	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1163	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	1163	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	74.7	mi/h
Number of lanes, N	3	
Density, D	15.6	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between Volvo Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2894	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	778	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1115	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1115	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	74.9	mi/h
Number of lanes, N	3	
Density, D	14.9	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between Volvo & SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2988	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	803	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1151	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1151	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	74.7	mi/h
Number of lanes, N	3	
Density, D	15.4	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between SC 27 Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2480	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	667	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	956	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	956	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	12.7	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: SC 27 to SC 453
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2635	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	708	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1523	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	1523	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	72.0	mi/h
Number of lanes, N	2	
Density, D	21.2	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between SC 453 Ramps
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2469	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	664	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1427	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.33	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.3	mi/h
Free-flow speed, FFS	74.1	mi/h

LOS and Performance Measures

Flow rate, vp	1427	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	73.0	mi/h
Number of lanes, N	2	
Density, D	19.6	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: West of SC 453
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2526	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	679	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1460	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.2	mi/h
Free-flow speed, FFS	72.2	mi/h

LOS and Performance Measures

Flow rate, vp	1460	pc/h/ln
Free-flow speed, FFS	72.2	mi/h
Average passenger-car speed, S	69.2	mi/h
Number of lanes, N	2	
Density, D	21.1	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1979	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	163	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	31	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1979	163	31	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v_{15}	538	45	9	v
Trucks and buses	10	24	52	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.893	0.794	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2259	203	43	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)

EQ

$P = 1.000$ Using Equation 0

FM

$v_{12} = v_{12} (P) = 2259$ pc/h

FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	2462	4800	No
FO			
v_{12} or v_{12}	0 pc/h	(Equation 13-14 or 13-17)	
v_{12} or v_{12}			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
Is v_{12} or v_{12}	> 1.5 v_{12} / 2	No	
If yes, v_{12}	= 2259	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2462	4600	No
R12			

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 19.6$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.311$

S

Space mean speed in ramp influence area, $S = 61.3$ mph

R

Space mean speed in outer lanes, $S = N/A$ mph

0

Space mean speed for all vehicles, $S = 61.3$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2007	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	519	vph
Length of first accel/decel lane	900	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	135	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2300	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2007	519	135	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v_{15}	545	144	38	v
Trucks and buses	10	7	8	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.966	0.962	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2291	597	156	pcph

Estimation of V12 Merge Areas

$$L = 445.83 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.603 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 1381 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	2888	7200	No
FO			
v_{12} or v_{12}	910 pc/h	(Equation 13-14 or 13-17)	
$\frac{v_{12}}{3}$ av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
$\frac{v_{12}}{3}$ av34			
Is v_{12} or v_{12}	> 1.5 $v_{12} / 2$	Yes	
$\frac{v_{12}}{3}$ av34	12		
If yes, v_{12}	= 1381	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1978	4600	No
12A			

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 15.0 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.286$

S

Space mean speed in ramp influence area, $S = 62.0$ mph

R

Space mean speed in outer lanes, $S = 68.5$ mph

0

Space mean speed for all vehicles, $S = 63.9$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2495	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-flow speed on ramp	35.0	mph
Volume on ramp	378	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane	1500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	31	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	3500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
	Ramp			
Volume, V (vph)	2495	378	31	vph
Peak-hour factor, PHF	0.92	0.92	0.92	

Peak 15-min volume, v_{15}	678	103	8	v
Trucks and buses	10	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2848	431	35	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)

EQ

$P = 0.555$ Using Equation 0

FM

$v_{12} = v_{FM} (P) = 1581$ pc/h

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v	3279	7200	No
FO			
v or v	1267 pc/h	(Equation 13-14 or 13-17)	
3 av34			
Is v or v	> 2700 pc/h?	No	
3 av34			
Is v or v	> 1.5 v /2	Yes	
3 av34	12		
If yes, v	= 1627	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

v_{12A}	Actual 2058	Max Desirable 4600	Violation? No
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Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_A - 0.00627 L = -6.9$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable, $M = 0.037$

S

Space mean speed in ramp influence area, $S_R = 69.0$ mph

R

Space mean speed in outer lanes, $S_0 = 67.4$ mph

0

Space mean speed for all vehicles, $S = 68.4$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2715	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	644	vph
Length of first accel/decel lane	1120	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	158	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2900	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2715	644	158	vph
Peak-hour factor, PHF	0.92	0.90	0.91	

Peak 15-min volume, v_{15}	738	179	43	v
Trucks and buses	10	7	19	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.966	0.913	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3099	741	190	pcph

Estimation of V12 Merge Areas

$$L = 747.24 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.609 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 1887 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	3840	7200	No
FO			
v_{12} or v_{12}	1212 pc/h	(Equation 13-14 or 13-17)	
3 av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
3 av34			
Is v_{12} or v_{12}	> 1.5 $v_{12} / 2$	Yes	
3 av34	12		
If yes, v_{12}	= 1887	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2628	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 18.6 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.297$

S

Space mean speed in ramp influence area, $S = 61.7 \text{ mph}$

R

Space mean speed in outer lanes, $S = 67.4 \text{ mph}$

0

Space mean speed for all vehicles, $S = 63.4 \text{ mph}$

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2863	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	155	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	627	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	750	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2863	155	627	vph
Peak-hour factor, PHF	0.93	0.90	0.95	

Peak 15-min volume, v_{15}	770	43	165	v
Trucks and buses	15	7	6	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.966	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3309	178	680	pcph

Estimation of V12 Merge Areas

$$L = 840.42 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.614 \text{ Using Equation 2}$$

FM

$$v_{12} = v_{12} (P) = 2031 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	3487	7200	No
FO			
v_{12} or v_{12}	1278 pc/h	(Equation 13-14 or 13-17)	
3 av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
3 av34			
Is v_{12} or v_{12}	> 1.5 $v_{12} / 2$	Yes	
3 av34	12		
If yes, v_{12}	= 2031	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2209	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 13.2 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.252$

S

Space mean speed in ramp influence area, $S = 63.0 \text{ mph}$

R

Space mean speed in outer lanes, $S = 67.2 \text{ mph}$

0

Space mean speed for all vehicles, $S = 64.4 \text{ mph}$

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2894	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	94	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	124	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2894	94	124	vph
Peak-hour factor, PHF	0.93	0.92	0.92	

Peak 15-min volume, v_{15}	778	26	34	v
Trucks and buses	15	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3345	107	142	pcph

Estimation of V12 Merge Areas

$$L = 832.93 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.619 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 2072 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	3452	7200	No
FO			
v_{12} or v_{12}	1273 pc/h	(Equation 13-14 or 13-17)	
3 av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
3 av34			
Is v_{12} or v_{12}	> 1.5 $v_{12} / 2$	Yes	
3 av34	12		
If yes, v_{12}	= 2072	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2179	4600	No
12A			

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 13.0 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.250$

S

Space mean speed in ramp influence area, $S = 63.0$ mph

R

Space mean speed in outer lanes, $S = 67.2$ mph

0

Space mean speed for all vehicles, $S = 64.5$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2480	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	155	vph
Length of first accel/decel lane	900	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	508	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2480	155	508	vph
Peak-hour factor, PHF	0.93	0.90	0.91	

Peak 15-min volume, v_{15}	667	43	140	v
Trucks and buses	15	7	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.966	0.966	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2867	178	578	pcph

Estimation of V12 Merge Areas

$$L = 479.43 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.603 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 1728 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	3045	7200	No
FO			
v_{12} or v_{12}	1139 pc/h	(Equation 13-14 or 13-17)	
3 av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
3 av34			
Is v_{12} or v_{12}	> 1.5 $v_{12} / 2$	Yes	
3 av34	12		
If yes, v_{12}	= 1728	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1906	4600	No
12A			

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 14.6 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.284$

S

Space mean speed in ramp influence area, $S = 62.0$ mph

R

Space mean speed in outer lanes, $S = 67.7$ mph

0

Space mean speed for all vehicles, $S = 64.0$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2023
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2469	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	57	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	166	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2469	57	166	vph
Peak-hour factor, PHF	0.93	0.90	0.90	

Peak 15-min volume, v ₁₅	664	16	46	v
Trucks and buses	15	24	21	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.930	0.893	0.905	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	2854	71	204	pcph

Estimation of V₁₂ Merge Areas

L = (Equation 13-6 or 13-7)

EQ

P = 1.000 Using Equation 0

FM

v = v₁₂ (P) = 2854 pc/h

FM

Capacity Checks

	Actual	Maximum	LOS F?
v	2925	4800	No
FO			
v or v ₃	0 pc/h	(Equation 13-14 or 13-17)	
av ₃₄			
Is v or v ₃	> 2700 pc/h?	No	
av ₃₄			
Is v or v ₃	> 1.5 v ₁₂ / 2	No	
av ₃₄			
If yes, v _{12A}	= 2854	(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v	2925	4600	No
R ₁₂			

Level of Service Determination (if not F)

Density, D = $5.475 + 0.00734 v_R + 0.0078 v_A - 0.00627 L$ = 23.2 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, M = 0.338

S

Space mean speed in ramp influence area, S = 60.5 mph

R

Space mean speed in outer lanes, S = N/A mph

0

Space mean speed for all vehicles, S = 60.5 mph

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Jedburg Road (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.95
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 561 veh/h
Opposing direction volume, Vo 407 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.3
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.993	0.979
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	595 pc/h	438 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	2.5	mi/h
Average travel speed, ATSD	33.0	mi/h
Percent Free Flow Speed, PFFS	75.8	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	591 pc/h	428 pc/h
Base percent time-spent-following,(note-4) BPTSFd	56.4	%
Adjustment for no-passing zones, fnp	37.0	
Percent time-spent-following, PTSFd	77.9	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.35
Peak 15-min vehicle-miles of travel, VMT15	148 veh-mi
Peak-hour vehicle-miles of travel, VMT60	561 veh-mi
Peak 15-min total travel time, TT15	4.5 veh-h
Capacity from ATS, CdATS	1664 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1664 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	33.0	mi/h
Percent time-spent-following, PTSFd (from above)	77.9	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 590.5
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.95
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Jedburg Road (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	60 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 686 veh/h
Opposing direction volume, Vo 836 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.993	1.000
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	751 pc/h	909 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	0.7	mi/h
Average travel speed, ATSD	29.9	mi/h
Percent Free Flow Speed, PFFS	68.8	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	746 pc/h	909 pc/h
Base percent time-spent-following,(note-4) BPTSFd	68.2	%
Adjustment for no-passing zones, fnp	21.9	
Percent time-spent-following, PTSFd	78.1	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.44
Peak 15-min vehicle-miles of travel, VMT15	186 veh-mi
Peak-hour vehicle-miles of travel, VMT60	686 veh-mi
Peak 15-min total travel time, TT15	6.2 veh-h
Capacity from ATS, CdATS	1700 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1700 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	29.9	mi/h
Percent time-spent-following, PTSFd (from above)	78.1	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 745.7
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 6.07
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Volvo Car Drive (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	6.0 ft	% Trucks and buses	10 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	20 %
Up/down	- %	Access point density	8 /mi

Analysis direction volume, Vd 155 veh/h
Opposing direction volume, Vo 472 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.6	1.2
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.943	0.980
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	179 pc/h	524 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 0.0 mi/h
Adj. for access point density,(note-3) fA 2.0 mi/h

Free-flow speed, FFSd	48.0	mi/h
Adjustment for no-passing zones, fnp	0.7	mi/h
Average travel speed, ATSD	41.8	mi/h
Percent Free Flow Speed, PFFS	87.2	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.990	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	170 pc/h	513 pc/h
Base percent time-spent-following,(note-4) BPTSFd	24.0	%
Adjustment for no-passing zones, fnp	24.8	
Percent time-spent-following, PTSFd	30.2	%

Level of Service and Other Performance Measures

Level of service, LOS	B
Volume to capacity ratio, v/c	0.11
Peak 15-min vehicle-miles of travel, VMT15	42 veh-mi
Peak-hour vehicle-miles of travel, VMT60	155 veh-mi
Peak 15-min total travel time, TT15	1.0 veh-h
Capacity from ATS, CdATS	1666 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1666 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	41.8	mi/h
Percent time-spent-following, PTSFd (from above)	30.2	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 168.5
Effective width of outside lane, We 28.05
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 3.48
Bicycle LOS C

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 27 (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	7 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	30 /mi

Analysis direction volume, Vd 452 veh/h
Opposing direction volume, Vo 581 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.2	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.986	0.993
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	509 pc/h	650 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 7.5 mi/h

Free-flow speed, FFSd	43.3	mi/h
Adjustment for no-passing zones, fnp	1.6	mi/h
Average travel speed, ATSD	32.7	mi/h
Percent Free Flow Speed, PFFS	75.4	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	502 pc/h	646 pc/h
Base percent time-spent-following,(note-4) BPTSFd	53.3	%
Adjustment for no-passing zones, fnp	34.3	
Percent time-spent-following, PTSFd	68.3	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.30
Peak 15-min vehicle-miles of travel, VMT15	126 veh-mi
Peak-hour vehicle-miles of travel, VMT60	452 veh-mi
Peak 15-min total travel time, TT15	3.9 veh-h
Capacity from ATS, CdATS	1688 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1688 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.7	mi/h
Percent time-spent-following, PTSFd (from above)	68.3	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 502.2
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 6.01
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 27 (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	10 /mi

Analysis direction volume, Vd 414 veh/h
Opposing direction volume, Vo 504 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.2	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.986	0.993
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	467 pc/h	564 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 2.5 mi/h

Free-flow speed, FFSd	49.5	mi/h
Adjustment for no-passing zones, fnp	2.0	mi/h
Average travel speed, ATSD	39.5	mi/h
Percent Free Flow Speed, PFFS	79.7	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	460 pc/h	560 pc/h
Base percent time-spent-following,(note-4) BPTSFd	49.7	%
Adjustment for no-passing zones, fnp	38.1	
Percent time-spent-following, PTSFd	66.9	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.27
Peak 15-min vehicle-miles of travel, VMT15	115 veh-mi
Peak-hour vehicle-miles of travel, VMT60	414 veh-mi
Peak 15-min total travel time, TT15	2.9 veh-h
Capacity from ATS, CdATS	1688 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1688 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	39.5	mi/h
Percent time-spent-following, PTSFd (from above)	66.9	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 460.0
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.83
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 453 (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	24 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	75 %
Up/down	- %	Access point density	4 /mi

Analysis direction volume, Vd 156 veh/h
Opposing direction volume, Vo 180 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.6	1.5
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.874	0.893
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	198 pc/h	224 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.7 mi/h
Adj. for access point density,(note-3) fA 1.0 mi/h

Free-flow speed, FFSd	39.3	mi/h
Adjustment for no-passing zones, fnp	3.5	mi/h
Average travel speed, ATSD	32.6	mi/h
Percent Free Flow Speed, PFFS	82.8	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.977	0.977
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	177 pc/h	205 pc/h
Base percent time-spent-following,(note-4) BPTSFd	19.3	%
Adjustment for no-passing zones, fnp	59.3	
Percent time-spent-following, PTSFd	46.8	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.12
Peak 15-min vehicle-miles of travel, VMT15	43 veh-mi
Peak-hour vehicle-miles of travel, VMT60	156 veh-mi
Peak 15-min total travel time, TT15	1.3 veh-h
Capacity from ATS, CdATS	1518 veh/h
Capacity from PTSF, CdPTSF	1660 veh/h
Directional Capacity	1518 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.6	mi/h
Percent time-spent-following, PTSFd (from above)	46.8	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 173.3
Effective width of outside lane, We 15.25
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 13.97
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 453 (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	24 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	70 %
Up/down	- %	Access point density	16 /mi

Analysis direction volume, Vd 170 veh/h
Opposing direction volume, Vo 243 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.5	1.4
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.893	0.912
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	212 pc/h	296 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 4.0 mi/h

Free-flow speed, FFSd	36.8	mi/h
Adjustment for no-passing zones, fnp	2.9	mi/h
Average travel speed, ATSD	30.0	mi/h
Percent Free Flow Speed, PFFS	81.5	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.977	0.977
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	193 pc/h	276 pc/h
Base percent time-spent-following,(note-4) BPTSFd	22.7	%
Adjustment for no-passing zones, fnp	54.2	
Percent time-spent-following, PTSFd	45.0	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.12
Peak 15-min vehicle-miles of travel, VMT15	47 veh-mi
Peak-hour vehicle-miles of travel, VMT60	170 veh-mi
Peak 15-min total travel time, TT15	1.6 veh-h
Capacity from ATS, CdATS	1550 veh/h
Capacity from PTSF, CdPTSF	1660 veh/h
Directional Capacity	1550 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	30.0	mi/h
Percent time-spent-following, PTSFd (from above)	45.0	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 188.9
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 14.33
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Jedburg Road (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.95
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 407 veh/h
Opposing direction volume, Vo 561 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.3	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.979	0.993
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	438 pc/h	595 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	1.8	mi/h
Average travel speed, ATSD	33.7	mi/h
Percent Free Flow Speed, PFFS	77.4	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	428 pc/h	591 pc/h
Base percent time-spent-following,(note-4) BPTSFd	47.8	%
Adjustment for no-passing zones, fnp	37.0	
Percent time-spent-following, PTSFd	63.3	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.26
Peak 15-min vehicle-miles of travel, VMT15	107 veh-mi
Peak-hour vehicle-miles of travel, VMT60	407 veh-mi
Peak 15-min total travel time, TT15	3.2 veh-h
Capacity from ATS, CdATS	1688 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1688 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	33.7	mi/h
Percent time-spent-following, PTSFd (from above)	63.3	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 428.4
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.79
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Jedburg Road (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	60 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 836 veh/h
Opposing direction volume, Vo 686 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	1.000	0.993
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	909 pc/h	751 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	0.9	mi/h
Average travel speed, ATSD	29.7	mi/h
Percent Free Flow Speed, PFFS	68.3	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	909 pc/h	746 pc/h
Base percent time-spent-following,(note-4) BPTSFd	73.0	%
Adjustment for no-passing zones, fnp	21.9	
Percent time-spent-following, PTSFd	85.0	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.53
Peak 15-min vehicle-miles of travel, VMT15	227 veh-mi
Peak-hour vehicle-miles of travel, VMT60	836 veh-mi
Peak 15-min total travel time, TT15	7.6 veh-h
Capacity from ATS, CdATS	1688 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1688 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	29.7	mi/h
Percent time-spent-following, PTSFd (from above)	85.0	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 908.7
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 6.17
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Volvo Car Drive (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	6.0 ft	% Trucks and buses	10 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	20 %
Up/down	- %	Access point density	8 /mi

Analysis direction volume, Vd 472 veh/h
Opposing direction volume, Vo 155 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.2	1.6
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.980	0.943
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	524 pc/h	179 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 0.0 mi/h
Adj. for access point density,(note-3) fA 2.0 mi/h

Free-flow speed, FFSd	48.0	mi/h
Adjustment for no-passing zones, fnp	0.9	mi/h
Average travel speed, ATSD	41.7	mi/h
Percent Free Flow Speed, PFFS	86.8	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	0.990
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	513 pc/h	170 pc/h
Base percent time-spent-following,(note-4) BPTSFd	45.5	%
Adjustment for no-passing zones, fnp	24.8	
Percent time-spent-following, PTSFd	64.1	%

Level of Service and Other Performance Measures

Level of service, LOS	B
Volume to capacity ratio, v/c	0.31
Peak 15-min vehicle-miles of travel, VMT15	128 veh-mi
Peak-hour vehicle-miles of travel, VMT60	472 veh-mi
Peak 15-min total travel time, TT15	3.1 veh-h
Capacity from ATS, CdATS	1603 veh/h
Capacity from PTSF, CdPTSF	1683 veh/h
Directional Capacity	1603 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	41.7	mi/h
Percent time-spent-following, PTSFd (from above)	64.1	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 513.0
Effective width of outside lane, We 24.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.10
Bicycle LOS E

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 27 (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	7 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	30 /mi

Analysis direction volume, Vd 581 veh/h
Opposing direction volume, Vo 452 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.2
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.993	0.986
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	650 pc/h	509 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 7.5 mi/h

Free-flow speed, FFSd	43.3	mi/h
Adjustment for no-passing zones, fnp	2.2	mi/h
Average travel speed, ATSD	32.1	mi/h
Percent Free Flow Speed, PFFS	74.1	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	646 pc/h	502 pc/h
Base percent time-spent-following,(note-4) BPTSFd	60.3	%
Adjustment for no-passing zones, fnp	34.3	
Percent time-spent-following, PTSFd	79.6	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.38
Peak 15-min vehicle-miles of travel, VMT15	161 veh-mi
Peak-hour vehicle-miles of travel, VMT60	581 veh-mi
Peak 15-min total travel time, TT15	5.0 veh-h
Capacity from ATS, CdATS	1676 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1676 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.1	mi/h
Percent time-spent-following, PTSFd (from above)	79.6	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 645.6
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 6.13
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 27 (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	10 /mi

Analysis direction volume, Vd 504 veh/h
Opposing direction volume, Vo 414 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.2
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.993	0.986
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	564 pc/h	467 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 2.5 mi/h

Free-flow speed, FFSd	49.5	mi/h
Adjustment for no-passing zones, fnp	2.4	mi/h
Average travel speed, ATSD	39.1	mi/h
Percent Free Flow Speed, PFFS	78.9	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	560 pc/h	460 pc/h
Base percent time-spent-following,(note-4) BPTSFd	54.0	%
Adjustment for no-passing zones, fnp	38.1	
Percent time-spent-following, PTSFd	74.9	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.33
Peak 15-min vehicle-miles of travel, VMT15	140 veh-mi
Peak-hour vehicle-miles of travel, VMT60	504 veh-mi
Peak 15-min total travel time, TT15	3.6 veh-h
Capacity from ATS, CdATS	1676 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1676 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	39.1	mi/h
Percent time-spent-following, PTSFd (from above)	74.9	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 560.0
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.93
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
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Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 453 (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	24 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	75 %
Up/down	- %	Access point density	4 /mi

Analysis direction volume, Vd 180 veh/h
Opposing direction volume, Vo 156 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.5	1.6
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.893	0.874
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	224 pc/h	198 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.7 mi/h
Adj. for access point density,(note-3) fA 1.0 mi/h

Free-flow speed, FFSd	39.3	mi/h
Adjustment for no-passing zones, fnp	3.6	mi/h
Average travel speed, ATSD	32.4	mi/h
Percent Free Flow Speed, PFFS	82.5	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.977	0.977
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	205 pc/h	177 pc/h
Base percent time-spent-following,(note-4) BPTSFd	22.0	%
Adjustment for no-passing zones, fnp	59.3	
Percent time-spent-following, PTSFd	53.8	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.13
Peak 15-min vehicle-miles of travel, VMT15	50 veh-mi
Peak-hour vehicle-miles of travel, VMT60	180 veh-mi
Peak 15-min total travel time, TT15	1.5 veh-h
Capacity from ATS, CdATS	1486 veh/h
Capacity from PTSF, CdPTSF	1660 veh/h
Directional Capacity	1486 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.4	mi/h
Percent time-spent-following, PTSFd (from above)	53.8	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 200.0
Effective width of outside lane, We 12.50
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 14.42
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 453 (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2023
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	24 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	70 %
Up/down	- %	Access point density	16 /mi

Analysis direction volume, Vd 243 veh/h
Opposing direction volume, Vo 170 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.4	1.5
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.912	0.893
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	296 pc/h	212 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 4.0 mi/h

Free-flow speed, FFSd	36.8	mi/h
Adjustment for no-passing zones, fnp	3.4	mi/h
Average travel speed, ATSD	29.5	mi/h
Percent Free Flow Speed, PFFS	80.1	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.977	0.977
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	276 pc/h	193 pc/h
Base percent time-spent-following,(note-4) BPTSFd	28.3	%
Adjustment for no-passing zones, fnp	54.2	
Percent time-spent-following, PTSFd	60.2	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.17
Peak 15-min vehicle-miles of travel, VMT15	68 veh-mi
Peak-hour vehicle-miles of travel, VMT60	243 veh-mi
Peak 15-min total travel time, TT15	2.3 veh-h
Capacity from ATS, CdATS	1518 veh/h
Capacity from PTSF, CdPTSF	1660 veh/h
Directional Capacity	1518 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	29.5	mi/h
Percent time-spent-following, PTSFd (from above)	60.2	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 270.0
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 14.51
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

June 2019

C.11 2043 BUILD – ALTERNATIVE 4



HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1978	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	67	vph
Length of first accel/decel lane	465	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	171	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1978	67	171	vph
Peak-hour factor, PHF	0.91	0.95	0.90	

Peak 15-min volume, v_{15}	543	18	48	v
Trucks and buses	24	53	36	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.791	0.847	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2434	89	224	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 2434$ pc/h

$v_{12} = 2434$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	2434	4800	No
$v_{12} = v_F + (v_R - v_F) P$	2345	4800	No
$v_{12} = v_F + (v_R - v_F) P$	89	2000	No
$v_{12} = v_F + (v_R - v_F) P$	0 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} > 2700$ pc/h?		No	
Is $v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 2434$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2434	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 21.0$ pc/mi/ln

$D = 21.0$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.436$

S

Space mean speed in ramp influence area, $S = 57.8$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 57.8 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2082	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	156	vph
Length of first accel/decel lane	250	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	670	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2300	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2082	156	670	vph
Peak-hour factor, PHF	0.91	0.90	0.90	

Peak 15-min volume, v_{15}	572	43	186	v
Trucks and buses	24	23	16	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.897	0.926	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2562	193	804	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.687$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 1821$ pc/h

$v_{12} = 1821$

Capacity Checks

	Actual	Maximum	LOS F?
v = v Fi F	2562	7200	No
v = v - v FO F R	2369	7200	No
v R	193	2000	No
v or v 3 av34	741 pc/h	(Equation 13-14 or 13-17)	
Is v or v 3 av34	> 2700 pc/h?	No	
Is v or v 3 av34	> 1.5 v /2	No	
If yes, v = 1821 12A	(Equation 13-15, 13-16, 13-18, or 13-19)		

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1821	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 17.7$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.445$

S

Space mean speed in ramp influence area, $S = 57.5$ mph

R

Space mean speed in outer lanes, S = 76.8 mph

0

Space mean speed for all vehicles, S = 62.0 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2596	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	186	vph
Length of first accel/decel lane	1200	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	500	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	3500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2596	186	500	vph
Peak-hour factor, PHF	0.91	0.92	0.92	

Peak 15-min volume, v_{15}	713	51	136	v
Trucks and buses	24	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3195	212	571	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.670$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 2212$ pc/h

$v_{12} = 2212$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	3195	7200	No
$v_{12} = v_F - v_R$	2983	7200	No
$v_{12} = v_R$	212	2000	No
$v_{12} \text{ or } v_{12}$	983 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_{12} > 2700$ pc/h?		No	
Is $v_{12} \text{ or } v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 2212$	(Equation 13-15, 13-16, 13-18, or 13-19)		
$v_{12} = 2212$			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2212	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 12.5$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.447$

S

Space mean speed in ramp influence area, $S = 57.5$ mph

R

Space mean speed in outer lanes, S = 76.8 mph

0

Space mean speed for all vehicles, S = 62.3 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2910	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	185	vph
Length of first accel/decel lane	180	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1105	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2900	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2910	185	1105	vph
Peak-hour factor, PHF	0.91	0.90	0.90	

Peak 15-min volume, v_{15}	799	51	307	v
Trucks and buses	24	29	11	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.873	0.948	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3582	235	1295	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.660$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 2443$ pc/h

$v_{12} = 2443$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	3582	7200	No
$v_{12} = v_F - v_R$	3347	7200	No
$v_{12} = v_R$	235	2000	No
v_{12} or v_{12}	1139 pc/h	(Equation 13-14 or 13-17)	
v_{12} or v_{12}	> 2700 pc/h?	No	
v_{12} or v_{12}	$> 1.5 v_{12} / 2$	No	
If yes, $v_{12} = 2443$	(Equation 13-15, 13-16, 13-18, or 13-19)		

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2443	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 23.6$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.449$

S

Space mean speed in ramp influence area, $S = 57.4$ mph

R

Space mean speed in outer lanes, S = 76.2 mph

0

Space mean speed for all vehicles, S = 62.3 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3726	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	404	vph
Length of first accel/decel lane	850	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	193	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	750	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3726	404	193	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v_{15}	1012	112	54	v
Trucks and buses	22	10	11	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.952	0.948	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	4495	471	226	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.626$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 2990$ pc/h

$v_{12} = 2990$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	4495	7200	No
$v_{12} = v_F - v_R$	4024	7200	No
$v_{12} = v_R$	471	2000	No
$v_{12} = v_F$ or $v_{12} = v_R$	1505 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} > 2700$ pc/h?		No	
Is $v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 2990$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2990	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 22.3$ pc/mi/ln

$D = 22.3$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.470$

S

Space mean speed in ramp influence area, $S = 56.8$ mph

R

Space mean speed in outer lanes, S = 74.8 mph

0

Space mean speed for all vehicles, S = 61.8 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3920	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	194	vph
Length of first accel/decel lane	150	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	404	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	920	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3920	194	404	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v_{15}	1065	54	112	v
Trucks and buses	22	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	4730	226	471	pcph

Estimation of V12 Diverge Areas

$$L = 514.91 \text{ (Equation 13-12 or 13-13)}$$

EQ

$$P = 0.631 \text{ Using Equation 5}$$

FD

$$v_{12} = v_F + (v_R - v_F) P = 3070 \text{ pc/h}$$

12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	4730	7200	No
$v_{12} = v_F - v_R$	4504	7200	No
$v_{12} = v_F$	226	2000	No
$v_{12} \text{ or } v_{12}$	1660 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_{12} > 2700 \text{ pc/h?}$		No	
Is $v_{12} \text{ or } v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 3070$	(Equation 13-15, 13-16, 13-18, or 13-19)		

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3070	4400	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L = 29.3 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

$$\text{Intermediate speed variable, } D = 0.448$$

S

$$\text{Space mean speed in ramp influence area, } S = 57.4 \text{ mph}$$

R

Space mean speed in outer lanes, S = 74.2 mph

0

Space mean speed for all vehicles, S = 62.4 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3515	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	743	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane	1500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	125	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3515	743	125	vph
Peak-hour factor, PHF	0.92	0.92	0.92	

Peak 15-min volume, v_{15}	955	202	34	v
Trucks and buses	22	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	4241	848	143	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.450$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 2375$ pc/h

$12 \quad R \quad F \quad R \quad FD$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	4241	7200	No
$F_i \quad F$			
$v_{12} = v_F - v_R$	3393	7200	No
$FO \quad F \quad R$			
v_R	848	4000	No
R			
v_{12} or v_{12}	1866 pc/h	(Equation 13-14 or 13-17)	
$3 \quad av_{34}$			
Is v_{12} or $v_{12} > 2700$ pc/h?		No	
$3 \quad av_{34}$			
Is v_{12} or $v_{12} > 1.5 v_{12} / 2$		Yes	
$3 \quad av_{34} \quad 12$			
If yes, $v_{12} = 2423$		(Equation 13-15, 13-16, 13-18, or 13-19)	
$12A$			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2423	4400	No
$12A$			

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = -15.4$ pc/mi/ln

$R \quad 12 \quad D$

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable, $D = 0.504$

S

Space mean speed in ramp influence area, $S = 55.9$ mph

R

Space mean speed in outer lanes, S = 73.6 mph

0

Space mean speed for all vehicles, S = 62.3 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2897	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	497	vph
Length of first accel/decel lane	250	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	154	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2897	497	154	vph
Peak-hour factor, PHF	0.92	0.94	0.90	

Peak 15-min volume, v_{15}	787	132	43	v
Trucks and buses	22	25	16	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.889	0.926	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3495	595	185	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.645$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 2466$ pc/h

$v_{12} = 2466$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	3495	7200	No
$v_{12} = v_F - v_R$	2900	7200	No
$v_{12} = v_R$	595	2000	No
v_{12} or v_{12}	1029 pc/h	(Equation 13-14 or 13-17)	
v_{12} or v_{12}	> 2700 pc/h?	No	
v_{12} or v_{12}	$> 1.5 v_{12} / 2$	No	
If yes, $v_{12} = 2466$	(Equation 13-15, 13-16, 13-18, or 13-19)		

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2466	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 23.2$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.482$

S

Space mean speed in ramp influence area, $S = 56.5$ mph

R

Space mean speed in outer lanes, S = 76.7 mph

0

Space mean speed for all vehicles, S = 61.3 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2554	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	192	vph
Length of first accel/decel lane	475	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	66	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2554	192	66	vph
Peak-hour factor, PHF	0.92	0.90	0.92	

Peak 15-min volume, v_{15}	694	53	18	v
Trucks and buses	22	46	36	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.813	0.847	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3081	262	85	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_R + (v_F - v_R) P = 3081$ pc/h

$v_{12} = 3081$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_R$	3081	4800	No
$v_{12} = v_F$			
$v_{12} = v_F - v_R$	2819	4800	No
$v_{12} = v_F$			
$v_{12} = v_R$	262	2000	No
$v_{12} = v_F$			
$v_{12} = v_F$ or $v_{12} = v_R$	0 pc/h	(Equation 13-14 or 13-17)	
$v_{12} = v_F$ or $v_{12} = v_R$			
Is $v_{12} = v_F$ or $v_{12} = v_R$ > 2700 pc/h?		No	
Is $v_{12} = v_F$ or $v_{12} = v_R$ > 1.5 $v_{12} / 2$		No	
If yes, $v_{12} = 3081$		(Equation 13-15, 13-16, 13-18, or 13-19)	
$v_{12} = 3081$			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3081	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 26.5$ pc/mi/ln

$D = 26.5$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.452$

S

Space mean speed in ramp influence area, $S = 57.4$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 57.4 mph

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: West of SC 453
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1978	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	543	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	1217	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.2	mi/h
Free-flow speed, FFS	72.2	mi/h

LOS and Performance Measures

Flow rate, vp	1217	pc/h/ln
Free-flow speed, FFS	72.2	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	2	
Density, D	17.4	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Between SC 453 Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1911	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	525	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	1176	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.33	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.3	mi/h
Free-flow speed, FFS	74.1	mi/h

LOS and Performance Measures

Flow rate, vp	1176	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	74.7	mi/h
Number of lanes, N	2	
Density, D	15.8	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: SC 453 to SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2082	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	572	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	1281	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	1281	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	74.1	mi/h
Number of lanes, N	2	
Density, D	17.3	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Between SC 27 Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	1926	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	529	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	790	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	790	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	10.5	pc/mi/ln
Level of service, LOS	A	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Between SC 27 & Volvo
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2596	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	713	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	1065	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1065	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	14.2	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Between Volvo Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2410	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	662	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	989	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	989	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	13.2	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Volvo to Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2910	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	799	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	1194	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1194	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	74.6	mi/h
Number of lanes, N	3	
Density, D	16.0	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2725	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	749	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	1118	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.50	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.8	mi/h
Free-flow speed, FFS	73.6	mi/h

LOS and Performance Measures

Flow rate, vp	1118	pc/h/ln
Free-flow speed, FFS	73.6	mi/h
Average passenger-car speed, S	74.8	mi/h
Number of lanes, N	3	
Density, D	14.9	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: EB
From/To: Jedburg to Nexton
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3830	veh/h
Peak-hour factor, PHF	0.91	
Peak 15-min volume, v15	1052	v
Trucks and buses	24	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.893	
Driver population factor, fp	1.00	
Flow rate, vp	1571	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.20	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.8	mi/h
Free-flow speed, FFS	71.6	mi/h

LOS and Performance Measures

Flow rate, vp	1571	pc/h/ln
Free-flow speed, FFS	71.6	mi/h
Average passenger-car speed, S	68.4	mi/h
Number of lanes, N	3	
Density, D	23.0	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Nexton to Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3920	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1065	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1577	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.33	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	4.1	mi/h
Free-flow speed, FFS	71.3	mi/h

LOS and Performance Measures

Flow rate, vp	1577	pc/h/ln
Free-flow speed, FFS	71.3	mi/h
Average passenger-car speed, S	68.4	mi/h
Number of lanes, N	3	
Density, D	23.1	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3322	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	903	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1336	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1336	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	73.8	mi/h
Number of lanes, N	3	
Density, D	18.1	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3726	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1012	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1498	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1498	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	72.3	mi/h
Number of lanes, N	3	
Density, D	20.7	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Jedburg to Volvo
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3515	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	955	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1414	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	1414	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	73.1	mi/h
Number of lanes, N	3	
Density, D	19.3	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between Volvo Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2772	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	753	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1115	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1115	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	74.9	mi/h
Number of lanes, N	3	
Density, D	14.9	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between Volvo & SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2897	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	787	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1165	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1165	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	74.7	mi/h
Number of lanes, N	3	
Density, D	15.6	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between SC 27 Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2400	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	652	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	965	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	965	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	12.9	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: SC 27 to SC 453
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2554	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	694	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1541	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	1541	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	71.8	mi/h
Number of lanes, N	2	
Density, D	21.5	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: Between SC 453 Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2362	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	642	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1425	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.33	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.3	mi/h
Free-flow speed, FFS	74.1	mi/h

LOS and Performance Measures

Flow rate, vp	1425	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	73.0	mi/h
Number of lanes, N	2	
Density, D	19.5	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: AM
Freeway/Direction: WB
From/To: West of SC 453
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2428	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	660	v
Trucks and buses	22	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.901	
Driver population factor, fp	1.00	
Flow rate, vp	1465	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.2	mi/h
Free-flow speed, FFS	72.2	mi/h

LOS and Performance Measures

Flow rate, vp	1465	pc/h/ln
Free-flow speed, FFS	72.2	mi/h
Average passenger-car speed, S	69.2	mi/h
Number of lanes, N	2	
Density, D	21.2	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1911	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	171	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	67	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	1911	171	67	vph
Peak-hour factor, PHF	0.91	0.90	0.95	

Peak 15-min volume, v_{15}	525	48	18	v
Trucks and buses	24	36	53	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.847	0.791	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2352	224	89	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)

EQ

$P = 1.000$ Using Equation 0

FM

$v_{12} = v_{12} (P) = 2352$ pc/h

FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	2576	4800	No
FO			
v_{12} or v_{12}	0 pc/h	(Equation 13-14 or 13-17)	
$\frac{v_{12}}{3}$ av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
$\frac{v_{12}}{3}$ av34			
Is v_{12} or v_{12}	$> 1.5 \frac{v_{12}}{12}$	No	
$\frac{v_{12}}{3}$ av34			
If yes, v_{12}	$= 2352$	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2576	4600	No
R12			

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 \frac{v_{12}}{R} + 0.0078 \frac{v_{12}}{A} - 0.00627 L = 20.4$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $M = 0.316$

S

Space mean speed in ramp influence area, $S = 61.1$ mph

R

Space mean speed in outer lanes, $S = N/A$ mph

0

Space mean speed for all vehicles, $S = 61.1$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1926	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	670	vph
Length of first accel/decel lane	900	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	156	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2300	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
	Ramp			
Volume, V (vph)	1926	670	156	vph
Peak-hour factor, PHF	0.91	0.90	0.90	

Peak 15-min volume, v_{15}	529	186	43	v
Trucks and buses	24	16	23	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.926	0.897	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2370	804	193	pcph

Estimation of V12 Merge Areas

$$L = 507.04 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.603 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 1428 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	3174	7200	No
FO			
v_{12} or v_{12}	942 pc/h	(Equation 13-14 or 13-17)	
v_{12} or v_{12}			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
v_{12} or v_{12}			
Is v_{12} or v_{12}	> 1.5 v_{12} / 2	Yes	
v_{12} or v_{12}			
If yes, v_{12}	= 1428	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2232	4600	No
12A			

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 16.9 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.294$

S

Space mean speed in ramp influence area, $S = 61.8 \text{ mph}$

R

Space mean speed in outer lanes, $S = 68.4 \text{ mph}$

0

Space mean speed for all vehicles, $S = 63.6 \text{ mph}$

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2410	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-flow speed on ramp	35.0	mph
Volume on ramp	500	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane	1500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	186	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	3500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2410	500	186	vph
Peak-hour factor, PHF	0.91	0.92	0.92	

Peak 15-min volume, v_{15}	662	136	51	v
Trucks and buses	24	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2966	571	212	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)

EQ

$P = 0.555$ Using Equation 0

FM

$v_{12} = v_F(P) = 1646$ pc/h

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	3537	7200	No
FO			
v_3 or v_{av34}	1320 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700$ pc/h?		No	
Is v_3 or $v_{av34} > 1.5 v_{12}/2$		Yes	
If yes, $v_{12A} = 1694$		(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2265	4600	No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_A - 0.00627 L = -5.3$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable, $M = 0.044$

S

Space mean speed in ramp influence area, $S_R = 68.8$ mph

R

Space mean speed in outer lanes, $S_0 = 67.2$ mph

0

Space mean speed for all vehicles, $S = 68.2$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: EB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2725	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	1105	vph
Length of first accel/decel lane	1120	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	185	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1900	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2725	1105	185	vph
Peak-hour factor, PHF	0.91	0.90	0.90	

Peak 15-min volume, v_{15}	749	307	51	v
Trucks and buses	24	11	29	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.893	0.948	0.873	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3354	1295	235	pcph

Estimation of V12 Merge Areas

$$L = 920.37 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.609 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 2042 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	4649	7200	No
FO			
v_{12} or v_{12}	1312 pc/h	(Equation 13-14 or 13-17)	
3 av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
3 av34			
Is v_{12} or v_{12}	> 1.5 $v_{12} / 2$	Yes	
3 av34	12		
If yes, v_{12}	= 2042	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	3337	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 23.9 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $M = 0.352$

S

Space mean speed in ramp influence area, $S = 60.1 \text{ mph}$

R

Space mean speed in outer lanes, $S = 67.1 \text{ mph}$

0

Space mean speed for all vehicles, $S = 61.9 \text{ mph}$

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3322	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	193	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	404	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	750	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3322	193	404	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v_{15}	903	54	112	v
Trucks and buses	22	11	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.948	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	4008	226	471	pcph

Estimation of V12 Merge Areas

$$L = 1000.28 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.604 \text{ Using Equation 2}$$

FM

$$v_{12} = v_{12} (P) = 2419 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	4234	7200	No
FO			
v_{12} or v_{12}	1589 pc/h	(Equation 13-14 or 13-17)	
v_{12} or v_{12}			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
v_{12} or v_{12}			
Is v_{12} or v_{12}	> 1.5 v_{12} / 2	Yes	
v_{12} or v_{12}			
If yes, v_{12}	= 2419	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2645	4600	No
12A			

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 16.6 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

$$\text{Intermediate speed variable, } M = 0.271$$

S

$$\text{Space mean speed in ramp influence area, } S = 62.4 \text{ mph}$$

R

$$\text{Space mean speed in outer lanes, } S = 66.1 \text{ mph}$$

0

$$\text{Space mean speed for all vehicles, } S = 63.7 \text{ mph}$$

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2772	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	125	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	743	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2772	125	743	vph
Peak-hour factor, PHF	0.92	0.92	0.92	

Peak 15-min volume, v_{15}	753	34	202	v
Trucks and buses	22	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3344	143	848	pcph

Estimation of V12 Merge Areas

$$L = 840.42 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.619 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 2072 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	3487	7200	No
FO			
v_{12} or v_{12}	1272 pc/h	(Equation 13-14 or 13-17)	
3 av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
3 av34			
Is v_{12} or v_{12}	> 1.5 $v_{12} / 2$	Yes	
3 av34	12		
If yes, v_{12}	= 2072	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2215	4600	No
12A			

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 13.3 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.252$

S

Space mean speed in ramp influence area, $S = 63.0 \text{ mph}$

R

Space mean speed in outer lanes, $S = 67.2 \text{ mph}$

0

Space mean speed for all vehicles, $S = 64.4 \text{ mph}$

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2400	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	154	vph
Length of first accel/decel lane	900	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	497	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2400	154	497	vph
Peak-hour factor, PHF	0.92	0.90	0.94	

Peak 15-min volume, v_{15}	652	43	132	v
Trucks and buses	22	16	25	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.901	0.926	0.889	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2896	185	595	pcph

Estimation of V12 Merge Areas

$$L = 487.13 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.603 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 1745 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	3081	7200	No
FO			
v_{12} or v_{12}	1151 pc/h	(Equation 13-14 or 13-17)	
v_{12} or v_{12}			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
v_{12} or v_{12}			
Is v_{12} or v_{12}	> 1.5 v_{12} / 2	Yes	
v_{12} or v_{12}			
If yes, v_{12}	= 1745	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1930	4600	No
12A			

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 14.8 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.285$

S

Space mean speed in ramp influence area, $S = 62.0 \text{ mph}$

R

Space mean speed in outer lanes, $S = 67.7 \text{ mph}$

0

Space mean speed for all vehicles, $S = 64.0 \text{ mph}$

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: AM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2362	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	66	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	192	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2362	66	192	vph
Peak-hour factor, PHF	0.92	0.92	0.90	

Peak 15-min volume, v ₁₅	642	18	53	v
Trucks and buses	22	36	46	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.901	0.847	0.813	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	2850	85	262	pcph

Estimation of V12 Merge Areas

L = (Equation 13-6 or 13-7)

EQ

P = 1.000 Using Equation 0

FM

v = v₁₂ (P) = 2850 pc/h

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v	2935	4800	No
FO			
v or v ₃	0 pc/h	(Equation 13-14 or 13-17)	
av ₃₄			
Is v or v ₃	> 2700 pc/h?	No	
av ₃₄			
Is v or v ₃	> 1.5 v ₁₂ / 2	No	
av ₃₄	12		
If yes, v _{12A}	= 2850	(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v	2935	4600	No
R12			

Level of Service Determination (if not F)

Density, D = $5.475 + 0.00734 v_R + 0.0078 v_A - 0.00627 L$ = 23.3 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, M = 0.338

S

Space mean speed in ramp influence area, S = 60.5 mph

R

Space mean speed in outer lanes, S = N/A mph

0

Space mean speed for all vehicles, S = 60.5 mph

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Jedburg Road (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.93
Shoulder width	2.5 ft	% Trucks and buses	11 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 451 veh/h
Opposing direction volume, Vo 719 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.2	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.978	0.989
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	496 pc/h	782 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	1.3	mi/h
Average travel speed, ATSD	32.3	mi/h
Percent Free Flow Speed, PFFS	74.3	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	485 pc/h	773 pc/h
Base percent time-spent-following,(note-4) BPTSFd	53.5	%
Adjustment for no-passing zones, fnp	29.9	
Percent time-spent-following, PTSFd	65.0	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.29
Peak 15-min vehicle-miles of travel, VMT15	121 veh-mi
Peak-hour vehicle-miles of travel, VMT60	451 veh-mi
Peak 15-min total travel time, TT15	3.7 veh-h
Capacity from ATS, CdATS	1681 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1681 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.3	mi/h
Percent time-spent-following, PTSFd (from above)	65.0	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 484.9
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 7.39
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Jedburg Road (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.94
Shoulder width	2.5 ft	% Trucks and buses	11 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	60 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 994 veh/h
Opposing direction volume, Vo 683 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	1.000	0.989
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	1057 pc/h	735 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	1.0	mi/h
Average travel speed, ATSD	28.6	mi/h
Percent Free Flow Speed, PFFS	65.8	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	1057 pc/h	727 pc/h
Base percent time-spent-following,(note-4) BPTSFd	77.5	%
Adjustment for no-passing zones, fnp	19.5	
Percent time-spent-following, PTSFd	89.1	%

Level of Service and Other Performance Measures

Level of service, LOS	E
Volume to capacity ratio, v/c	0.62
Peak 15-min vehicle-miles of travel, VMT15	264 veh-mi
Peak-hour vehicle-miles of travel, VMT60	994 veh-mi
Peak 15-min total travel time, TT15	9.2 veh-h
Capacity from ATS, CdATS	1681 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1681 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	28.6	mi/h
Percent time-spent-following, PTSFd (from above)	89.1	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 1057.4
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 7.79
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Volvo Car Drive (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	6.0 ft	% Trucks and buses	10 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	20 %
Up/down	- %	Access point density	8 /mi

Analysis direction volume, Vd 928 veh/h
Opposing direction volume, Vo 625 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	1.000	0.990
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	1009 pc/h	686 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 0.0 mi/h
Adj. for access point density,(note-3) fA 2.0 mi/h

Free-flow speed, FFSd	48.0	mi/h
Adjustment for no-passing zones, fnp	0.5	mi/h
Average travel speed, ATSD	34.4	mi/h
Percent Free Flow Speed, PFFS	71.7	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	1009 pc/h	679 pc/h
Base percent time-spent-following,(note-4) BPTSFd	75.5	%
Adjustment for no-passing zones, fnp	16.3	
Percent time-spent-following, PTSFd	85.2	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.59
Peak 15-min vehicle-miles of travel, VMT15	252 veh-mi
Peak-hour vehicle-miles of travel, VMT60	928 veh-mi
Peak 15-min total travel time, TT15	7.3 veh-h
Capacity from ATS, CdATS	1683 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1683 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	34.4	mi/h
Percent time-spent-following, PTSFd (from above)	85.2	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 1008.7
Effective width of outside lane, We 24.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.45
Bicycle LOS E

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 27 (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.93
Shoulder width	1.0 ft	% Trucks and buses	16 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	30 /mi

Analysis direction volume, Vd 549 veh/h
Opposing direction volume, Vo 500 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.2
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.984	0.969
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	600 pc/h	555 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 7.5 mi/h

Free-flow speed, FFSd	43.3	mi/h
Adjustment for no-passing zones, fnp	2.0	mi/h
Average travel speed, ATSD	32.3	mi/h
Percent Free Flow Speed, PFFS	74.7	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	590 pc/h	538 pc/h
Base percent time-spent-following,(note-4) BPTSFd	57.5	%
Adjustment for no-passing zones, fnp	36.0	
Percent time-spent-following, PTSFd	76.3	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.35
Peak 15-min vehicle-miles of travel, VMT15	148 veh-mi
Peak-hour vehicle-miles of travel, VMT60	549 veh-mi
Peak 15-min total travel time, TT15	4.6 veh-h
Capacity from ATS, CdATS	1647 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1647 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.3	mi/h
Percent time-spent-following, PTSFd (from above)	76.3	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 590.3
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 10.01
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
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Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 27 (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.91
Shoulder width	2.5 ft	% Trucks and buses	16 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	10 /mi

Analysis direction volume, Vd 695 veh/h
Opposing direction volume, Vo 480 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.2
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.984	0.969
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	776 pc/h	544 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 2.5 mi/h

Free-flow speed, FFSd	49.5	mi/h
Adjustment for no-passing zones, fnp	2.1	mi/h
Average travel speed, ATSD	37.1	mi/h
Percent Free Flow Speed, PFFS	75.0	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	764 pc/h	527 pc/h
Base percent time-spent-following,(note-4) BPTSFd	65.4	%
Adjustment for no-passing zones, fnp	30.0	
Percent time-spent-following, PTSFd	83.2	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.46
Peak 15-min vehicle-miles of travel, VMT15	191 veh-mi
Peak-hour vehicle-miles of travel, VMT60	695 veh-mi
Peak 15-min total travel time, TT15	5.1 veh-h
Capacity from ATS, CdATS	1647 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1647 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	37.1	mi/h
Percent time-spent-following, PTSFd (from above)	83.2	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 763.7
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 10.01
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 453 (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	1.0 ft	% Trucks and buses	36 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	75 %
Up/down	- %	Access point density	4 /mi

Analysis direction volume, Vd 234 veh/h
Opposing direction volume, Vo 151 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.4	1.6
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.874	0.822
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	291 pc/h	200 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.7 mi/h
Adj. for access point density,(note-3) fA 1.0 mi/h

Free-flow speed, FFSd	39.3	mi/h
Adjustment for no-passing zones, fnp	3.6	mi/h
Average travel speed, ATSD	31.9	mi/h
Percent Free Flow Speed, PFFS	81.1	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.965	0.965
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	264 pc/h	170 pc/h
Base percent time-spent-following,(note-4) BPTSFd	27.2	%
Adjustment for no-passing zones, fnp	53.7	
Percent time-spent-following, PTSFd	59.9	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.17
Peak 15-min vehicle-miles of travel, VMT15	64 veh-mi
Peak-hour vehicle-miles of travel, VMT60	234 veh-mi
Peak 15-min total travel time, TT15	2.0 veh-h
Capacity from ATS, CdATS	1397 veh/h
Capacity from PTSF, CdPTSF	1641 veh/h
Directional Capacity	1397 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	31.9	mi/h
Percent time-spent-following, PTSFd (from above)	59.9	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 254.3
Effective width of outside lane, We 12.50
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 24.36
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 453 (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	36 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	70 %
Up/down	- %	Access point density	16 /mi

Analysis direction volume, Vd 227 veh/h
Opposing direction volume, Vo 190 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.4	1.5
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.874	0.847
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	289 pc/h	249 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 4.0 mi/h

Free-flow speed, FFSd	36.8	mi/h
Adjustment for no-passing zones, fnp	3.2	mi/h
Average travel speed, ATSD	29.5	mi/h
Percent Free Flow Speed, PFFS	80.1	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.965	0.965
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	261 pc/h	219 pc/h
Base percent time-spent-following,(note-4) BPTSFd	27.9	%
Adjustment for no-passing zones, fnp	56.6	
Percent time-spent-following, PTSFd	58.7	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.17
Peak 15-min vehicle-miles of travel, VMT15	63 veh-mi
Peak-hour vehicle-miles of travel, VMT60	227 veh-mi
Peak 15-min total travel time, TT15	2.1 veh-h
Capacity from ATS, CdATS	1440 veh/h
Capacity from PTSF, CdPTSF	1641 veh/h
Directional Capacity	1440 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	29.5	mi/h
Percent time-spent-following, PTSFd (from above)	58.7	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 252.2
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 24.29
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Jedburg Road (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.93
Shoulder width	2.5 ft	% Trucks and buses	11 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 719 veh/h
Opposing direction volume, Vo 451 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.2
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.989	0.978
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	782 pc/h	496 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	2.3	mi/h
Average travel speed, ATSD	31.3	mi/h
Percent Free Flow Speed, PFFS	72.0	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	773 pc/h	485 pc/h
Base percent time-spent-following,(note-4) BPTSFd	65.8	%
Adjustment for no-passing zones, fnp	29.9	
Percent time-spent-following, PTSFd	84.2	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.46
Peak 15-min vehicle-miles of travel, VMT15	193 veh-mi
Peak-hour vehicle-miles of travel, VMT60	719 veh-mi
Peak 15-min total travel time, TT15	6.2 veh-h
Capacity from ATS, CdATS	1663 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1663 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	31.3	mi/h
Percent time-spent-following, PTSFd (from above)	84.2	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 773.1
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 7.63
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Jedburg Road (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.94
Shoulder width	2.5 ft	% Trucks and buses	11 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	60 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 683 veh/h
Opposing direction volume, Vo 994 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.989	1.000
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	735 pc/h	1057 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	0.6	mi/h
Average travel speed, ATSD	29.0	mi/h
Percent Free Flow Speed, PFFS	66.7	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	727 pc/h	1057 pc/h
Base percent time-spent-following,(note-4) BPTSFd	69.0	%
Adjustment for no-passing zones, fnp	19.5	
Percent time-spent-following, PTSFd	76.9	%

Level of Service and Other Performance Measures

Level of service, LOS	E
Volume to capacity ratio, v/c	0.43
Peak 15-min vehicle-miles of travel, VMT15	182 veh-mi
Peak-hour vehicle-miles of travel, VMT60	683 veh-mi
Peak 15-min total travel time, TT15	6.3 veh-h
Capacity from ATS, CdATS	1700 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1700 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	29.0	mi/h
Percent time-spent-following, PTSFd (from above)	76.9	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 726.6
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 7.60
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway Volvo Car Drive (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	6.0 ft	% Trucks and buses	10 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	20 %
Up/down	- %	Access point density	8 /mi

Analysis direction volume, Vd 625 veh/h
Opposing direction volume, Vo 928 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.990	1.000
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	686 pc/h	1009 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 0.0 mi/h
Adj. for access point density,(note-3) fA 2.0 mi/h

Free-flow speed, FFSd	48.0	mi/h
Adjustment for no-passing zones, fnp	0.4	mi/h
Average travel speed, ATSD	34.5	mi/h
Percent Free Flow Speed, PFFS	71.8	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	679 pc/h	1009 pc/h
Base percent time-spent-following,(note-4) BPTSFd	66.4	%
Adjustment for no-passing zones, fnp	16.3	
Percent time-spent-following, PTSFd	73.0	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.40
Peak 15-min vehicle-miles of travel, VMT15	170 veh-mi
Peak-hour vehicle-miles of travel, VMT60	625 veh-mi
Peak 15-min total travel time, TT15	4.9 veh-h
Capacity from ATS, CdATS	1700 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1700 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	34.5	mi/h
Percent time-spent-following, PTSFd (from above)	73.0	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 679.3
Effective width of outside lane, We 24.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.25
Bicycle LOS E

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 27 (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.93
Shoulder width	1.0 ft	% Trucks and buses	16 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	30 /mi

Analysis direction volume, Vd 500 veh/h
Opposing direction volume, Vo 549 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.2	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.969	0.984
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	555 pc/h	600 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 7.5 mi/h

Free-flow speed, FFSd	43.3	mi/h
Adjustment for no-passing zones, fnp	1.8	mi/h
Average travel speed, ATSD	32.5	mi/h
Percent Free Flow Speed, PFFS	75.1	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	538 pc/h	590 pc/h
Base percent time-spent-following,(note-4) BPTSFd	53.9	%
Adjustment for no-passing zones, fnp	36.0	
Percent time-spent-following, PTSFd	71.1	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.33
Peak 15-min vehicle-miles of travel, VMT15	134 veh-mi
Peak-hour vehicle-miles of travel, VMT60	500 veh-mi
Peak 15-min total travel time, TT15	4.1 veh-h
Capacity from ATS, CdATS	1673 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1673 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.5	mi/h
Percent time-spent-following, PTSFd (from above)	71.1	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 537.6
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 9.97
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 27 (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.91
Shoulder width	2.5 ft	% Trucks and buses	16 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	10 /mi

Analysis direction volume, Vd 480 veh/h
Opposing direction volume, Vo 695 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.2	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.969	0.984
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	544 pc/h	776 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 2.5 mi/h

Free-flow speed, FFSd	49.5	mi/h
Adjustment for no-passing zones, fnp	1.4	mi/h
Average travel speed, ATSD	37.9	mi/h
Percent Free Flow Speed, PFFS	76.6	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	527 pc/h	764 pc/h
Base percent time-spent-following,(note-4) BPTSFd	56.5	%
Adjustment for no-passing zones, fnp	30.0	
Percent time-spent-following, PTSFd	68.7	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.32
Peak 15-min vehicle-miles of travel, VMT15	132 veh-mi
Peak-hour vehicle-miles of travel, VMT60	480 veh-mi
Peak 15-min total travel time, TT15	3.5 veh-h
Capacity from ATS, CdATS	1673 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1673 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	37.9	mi/h
Percent time-spent-following, PTSFd (from above)	68.7	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 527.5
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 9.82
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
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Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 453 (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	1.0 ft	% Trucks and buses	36 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	75 %
Up/down	- %	Access point density	4 /mi

Analysis direction volume, Vd 151 veh/h
Opposing direction volume, Vo 234 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.6	1.4
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.822	0.874
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	200 pc/h	291 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.7 mi/h
Adj. for access point density,(note-3) fA 1.0 mi/h

Free-flow speed, FFSd	39.3	mi/h
Adjustment for no-passing zones, fnp	3.1	mi/h
Average travel speed, ATSD	32.4	mi/h
Percent Free Flow Speed, PFFS	82.5	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.965	0.965
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	170 pc/h	264 pc/h
Base percent time-spent-following,(note-4) BPTSFd	20.7	%
Adjustment for no-passing zones, fnp	53.7	
Percent time-spent-following, PTSFd	41.7	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.12
Peak 15-min vehicle-miles of travel, VMT15	41 veh-mi
Peak-hour vehicle-miles of travel, VMT60	151 veh-mi
Peak 15-min total travel time, TT15	1.3 veh-h
Capacity from ATS, CdATS	1486 veh/h
Capacity from PTSF, CdPTSF	1641 veh/h
Directional Capacity	1486 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.4	mi/h
Percent time-spent-following, PTSFd (from above)	41.7	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 164.1
Effective width of outside lane, We 15.56
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 23.71
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period AM
Highway SC 453 (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	36 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	70 %
Up/down	- %	Access point density	16 /mi

Analysis direction volume, Vd 190 veh/h
Opposing direction volume, Vo 227 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.5	1.4
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.847	0.874
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	249 pc/h	289 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 4.0 mi/h

Free-flow speed, FFSd	36.8	mi/h
Adjustment for no-passing zones, fnp	2.9	mi/h
Average travel speed, ATSD	29.7	mi/h
Percent Free Flow Speed, PFFS	80.7	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.965	0.965
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	219 pc/h	261 pc/h
Base percent time-spent-following,(note-4) BPTSFd	24.4	%
Adjustment for no-passing zones, fnp	56.6	
Percent time-spent-following, PTSFd	50.2	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.15
Peak 15-min vehicle-miles of travel, VMT15	53 veh-mi
Peak-hour vehicle-miles of travel, VMT60	190 veh-mi
Peak 15-min total travel time, TT15	1.8 veh-h
Capacity from ATS, CdATS	1486 veh/h
Capacity from PTSF, CdPTSF	1641 veh/h
Directional Capacity	1486 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	29.7	mi/h
Percent time-spent-following, PTSFd (from above)	50.2	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 211.1
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 24.20
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2604	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	37	vph
Length of first accel/decel lane	465	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	194	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2604	37	194	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v_{15}	708	10	54	v
Trucks and buses	10	52	24	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.794	0.893	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2972	52	241	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 2972$ pc/h

$v_{12} = 2972$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	2972	4800	No
$v_{12} = v_F - v_R$	2920	4800	No
$v_{12} = v_F + v_R$	52	2000	No
v_{12} or v_{12}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_{12} or $v_{12} > 2700$ pc/h?		No	
Is v_{12} or $v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 2972$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2972	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 25.6$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.433$

S

Space mean speed in ramp influence area, $S = 57.9$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 57.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2761	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	178	vph
Length of first accel/decel lane	250	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	686	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2300	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2761	178	686	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v_{15}	750	49	191	v
Trucks and buses	10	8	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.962	0.966	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3151	206	789	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.672$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 2184$ pc/h

$v_{12} = 2184$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	3151	7200	No
$v_{12} = v_F - v_R$	2945	7200	No
$v_{12} = v_F$	206	2000	No
$v_{12} = v_F$ or $v_{12} = v_R$	967 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} = v_F$ or $v_{12} = v_R > 2700$ pc/h?		No	
Is $v_{12} = v_F$ or $v_{12} = v_R > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 2184$	(Equation 13-15, 13-16, 13-18, or 13-19)		
$v_{12} = 2184$			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2184	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 20.8$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.447$

S

Space mean speed in ramp influence area, $S = 57.5$ mph

R

Space mean speed in outer lanes, S = 76.8 mph

0

Space mean speed for all vehicles, S = 62.3 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3269	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	86	vph
Length of first accel/decel lane	1200	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	623	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	3500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3269	86	623	vph
Peak-hour factor, PHF	0.92	0.92	0.92	

Peak 15-min volume, v_{15}	888	23	169	v
Trucks and buses	10	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3731	98	711	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.662$ Using Equation 5

FD

$v_{12} = v_R + (v_F - v_R) P = 2504$ pc/h

v_{12} R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_R$	3731	7200	No
$v_{12} = v_F$			
$v_{12} = v_F - v_R$	3633	7200	No
$v_{12} = v_F$			
$v_{12} = v_R$	98	2000	No
$v_{12} = v_F$			
$v_{12} = v_F$	1227 pc/h	(Equation 13-14 or 13-17)	
$v_{12} = v_F$			
Is $v_{12} = v_F > 2700$ pc/h?		No	
Is $v_{12} = v_F > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 2504$		(Equation 13-15, 13-16, 13-18, or 13-19)	
v_{12}			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2504	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 15.0$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D = 0.437$

S

Space mean speed in ramp influence area, $S = 57.8$ mph

R

Space mean speed in outer lanes, S = 75.9 mph

0

Space mean speed for all vehicles, S = 62.7 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3806	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	202	vph
Length of first accel/decel lane	180	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	824	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2900	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3806	202	824	vph
Peak-hour factor, PHF	0.92	0.91	0.90	

Peak 15-min volume, v_{15}	1034	55	229	v
Trucks and buses	10	19	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.913	0.966	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	4344	243	948	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.640$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 2869$ pc/h

$v_{12} = 2869$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	4344	7200	No
$v_{12} = v_F - v_R$	4101	7200	No
$v_{12} = v_R$	243	2000	No
v_{12} or v_{12}	1475 pc/h	(Equation 13-14 or 13-17)	
v_{12} or v_{12}	> 2700 pc/h?	No	
v_{12} or v_{12}	$> 1.5 v_{12} / 2$	No	
If yes, $v_{12} = 2869$	(Equation 13-15, 13-16, 13-18, or 13-19)		

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2869	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 27.3$ pc/mi/ln

$D = 27.3$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.450$

S

Space mean speed in ramp influence area, $S = 57.4$ mph

R

Space mean speed in outer lanes, S = 74.9 mph

0

Space mean speed for all vehicles, S = 62.4 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	4815	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	802	vph
Length of first accel/decel lane	850	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	198	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	750	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	4815	802	198	vph
Peak-hour factor, PHF	0.93	0.95	0.90	

Peak 15-min volume, v_{15}	1294	211	55	v
Trucks and buses	15	6	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.971	0.966	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	5566	870	228	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.581$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 3598$ pc/h

$v_{12} = 3598$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	5566	7200	No
$v_{12} = v_F - v_R$	4696	7200	No
$v_{12} = v_R$	870	2000	No
v_{12} or v_{12}	1968 pc/h	(Equation 13-14 or 13-17)	
v_{12} or v_{12}	> 2700 pc/h?	No	
v_{12} or v_{12}	$> 1.5 v_{12} / 2$	No	
If yes, $v_{12} = 3598$	(Equation 13-15, 13-16, 13-18, or 13-19)		

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3598	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 27.5$ pc/mi/ln

$D = 27.5$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $D = 0.506$

S

Space mean speed in ramp influence area, $S = 55.8$ mph

R

Space mean speed in outer lanes, S = 73.0 mph

0

Space mean speed for all vehicles, S = 60.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	5170	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	355	vph
Length of first accel/decel lane	150	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	802	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	920	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	5170	355	802	vph
Peak-hour factor, PHF	0.93	0.95	0.95	

Peak 15-min volume, v_{15}	1390	93	211	v
Trucks and buses	15	6	6	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	5976	385	870	pcph

Estimation of V12 Diverge Areas

$$L = 1066.12 \text{ (Equation 13-12 or 13-13)}$$

EQ

$$P = 0.608 \text{ Using Equation 7}$$

FD

$$v_{12} = v_F + (v_R - v_F) P = 3783 \text{ pc/h}$$

12 R F R FD

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	5976	7200	No
$v_{12} = v_F - v_R$	5591	7200	No
$v_{12} = v_F$	385	2000	No
$v_{12} \text{ or } v_{12}$	2193 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_{12} > 2700 \text{ pc/h?}$		No	
Is $v_{12} \text{ or } v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 3783$	(Equation 13-15, 13-16, 13-18, or 13-19)		
12A			

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3783	4400	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L = 35.4 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence E

Speed Estimation

$$\text{Intermediate speed variable, } D = 0.463$$

S

$$\text{Space mean speed in ramp influence area, } S = 57.0 \text{ mph}$$

R

Space mean speed in outer lanes, S = 72.1 mph

0

Space mean speed for all vehicles, S = 61.8 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	4211	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	347	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane	1500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	156	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	4211	347	156	vph
Peak-hour factor, PHF	0.93	0.92	0.92	

Peak 15-min volume, v_{15}	1132	94	42	v
Trucks and buses	15	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	4868	396	178	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.450$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 2408$ pc/h

$v_{12} = 2408$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	4868	7200	No
$v_{12} = v_F - v_R$	4472	7200	No
$v_{12} = v_F$	396	4000	No
$v_{12} = v_F$	2460 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} > 2700$ pc/h?		No	
Is $v_{12} > 1.5 v_{12} / 2$		Yes	
If yes, $v_{12} = 2781$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
$v_{12} = 2781$	2781	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = -12.3$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable, $D = 0.464$

S

Space mean speed in ramp influence area, $S = 57.0$ mph

R

Space mean speed in outer lanes, S = 72.6 mph

0

Space mean speed for all vehicles, S = 62.8 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	4020	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	672	vph
Length of first accel/decel lane	250	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	205	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	2500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	4020	672	205	vph
Peak-hour factor, PHF	0.93	0.91	0.90	

Peak 15-min volume, v_{15}	1081	185	57	v
Trucks and buses	15	7	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.966	0.966	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	4647	764	236	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 0.609$ Using Equation 5

FD

$v_{12} = v_F + (v_R - v_F) P = 3128$ pc/h

$v_{12} = 3128$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	4647	7200	No
$v_{12} = v_F - v_R$	3883	7200	No
$v_{12} = v_F$	764	2000	No
$v_{12} = v_F$	1519 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} > 2700$ pc/h?	No		
Is $v_{12} > 1.5 v_{12} / 2$	No		
If yes, $v_{12} = 3128$	(Equation 13-15, 13-16, 13-18, or 13-19)		

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3128	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 28.9$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable, $D = 0.497$

S

Space mean speed in ramp influence area, $S = 56.1$ mph

R

Space mean speed in outer lanes, S = 74.8 mph

0

Space mean speed for all vehicles, S = 61.1 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3553	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	198	vph
Length of first accel/decel lane	475	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	69	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3553	198	69	vph
Peak-hour factor, PHF	0.93	0.90	0.90	

Peak 15-min volume, v_{15}	955	55	19	v
Trucks and buses	15	21	24	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.905	0.893	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	4107	243	86	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 13-12 or 13-13)

EQ

$P = 1.000$ Using Equation 0

FD

$v_{12} = v_F + (v_R - v_F) P = 4107$ pc/h

$v_{12} = 4107$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{12} = v_F$	4107	4800	No
$v_{12} = v_F - v_R$	3864	4800	No
$v_{12} = v_R$	243	2000	No
$v_{12} \text{ or } v_R$	0 pc/h	(Equation 13-14 or 13-17)	
Is $v_{12} \text{ or } v_R > 2700$ pc/h?		No	
Is $v_{12} \text{ or } v_R > 1.5 v_{12} / 2$		No	
If yes, $v_{12} = 4107$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	4107	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L = 35.3$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence E

Speed Estimation

Intermediate speed variable, $D = 0.450$

S

Space mean speed in ramp influence area, $S = 57.4$ mph

	R	
Space mean speed in outer lanes,	0	S = N/A mph
Space mean speed for all vehicles,		S = 57.4 mph

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: West of SC 453
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2604	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	708	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1486	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.2	mi/h
Free-flow speed, FFS	72.2	mi/h

LOS and Performance Measures

Flow rate, vp	1486	pc/h/ln
Free-flow speed, FFS	72.2	mi/h
Average passenger-car speed, S	69.1	mi/h
Number of lanes, N	2	
Density, D	21.5	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Between SC 453 Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2567	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	698	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1465	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.33	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.3	mi/h
Free-flow speed, FFS	74.1	mi/h

LOS and Performance Measures

Flow rate, vp	1465	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	72.6	mi/h
Number of lanes, N	2	
Density, D	20.2	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: SC 453 to SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2761	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	750	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1576	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	1576	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	71.3	mi/h
Number of lanes, N	2	
Density, D	22.1	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Between SC 27 Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	2583	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	702	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	983	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	983	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	13.1	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Between SC 27 & Volvo
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3269	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	888	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1244	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1244	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	74.3	mi/h
Number of lanes, N	3	
Density, D	16.7	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Between Volvo Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3183	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	865	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1211	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1211	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	74.5	mi/h
Number of lanes, N	3	
Density, D	16.3	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Volvo to Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3806	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1034	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1448	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1448	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	72.8	mi/h
Number of lanes, N	3	
Density, D	19.9	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3604	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	979	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1371	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.50	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.8	mi/h
Free-flow speed, FFS	73.6	mi/h

LOS and Performance Measures

Flow rate, vp	1371	pc/h/ln
Free-flow speed, FFS	73.6	mi/h
Average passenger-car speed, S	73.5	mi/h
Number of lanes, N	3	
Density, D	18.7	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: EB
From/To: Jedburg to Nexton
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	4428	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	1203	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	1685	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.20	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.8	mi/h
Free-flow speed, FFS	71.6	mi/h

LOS and Performance Measures

Flow rate, vp	1685	pc/h/ln
Free-flow speed, FFS	71.6	mi/h
Average passenger-car speed, S	67.3	mi/h
Number of lanes, N	3	
Density, D	25.0	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Nexton to Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	5170	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	1390	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1992	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.33	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	4.1	mi/h
Free-flow speed, FFS	71.3	mi/h

LOS and Performance Measures

Flow rate, vp	1992	pc/h/ln
Free-flow speed, FFS	71.3	mi/h
Average passenger-car speed, S	62.7	mi/h
Number of lanes, N	3	
Density, D	31.8	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	4013	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	1079	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1546	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1546	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	71.7	mi/h
Number of lanes, N	3	
Density, D	21.6	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between Jedburg Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	4815	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	1294	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1855	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1855	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	66.9	mi/h
Number of lanes, N	3	
Density, D	27.7	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Jedburg to Volvo
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	4211	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	1132	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1623	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.8	mi/h
Free-flow speed, FFS	72.6	mi/h

LOS and Performance Measures

Flow rate, vp	1623	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	70.7	mi/h
Number of lanes, N	3	
Density, D	23.0	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between Volvo Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3864	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	1039	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1489	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1489	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	72.4	mi/h
Number of lanes, N	3	
Density, D	20.6	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between Volvo & SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	4020	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	1081	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1549	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1549	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	71.7	mi/h
Number of lanes, N	3	
Density, D	21.6	pc/mi/ln
Level of service, LOS	C	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between SC 27 Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3348	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	900	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1290	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.67	ramps/mi
Number of lanes, N	3	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	2.3	mi/h
Free-flow speed, FFS	73.1	mi/h

LOS and Performance Measures

Flow rate, vp	1290	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	74.1	mi/h
Number of lanes, N	3	
Density, D	17.4	pc/mi/ln
Level of service, LOS	B	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: SC 27 to SC 453
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3553	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	955	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	2053	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	0.0	mi/h
Free-flow speed, FFS	75.4	mi/h

LOS and Performance Measures

Flow rate, vp	2053	pc/h/ln
Free-flow speed, FFS	75.4	mi/h
Average passenger-car speed, S	62.7	mi/h
Number of lanes, N	2	
Density, D	32.7	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: _____ Fax: _____
E-mail: _____

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: Between SC 453 Ramps
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3355	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	902	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1939	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.33	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.3	mi/h
Free-flow speed, FFS	74.1	mi/h

LOS and Performance Measures

Flow rate, vp	1939	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	65.2	mi/h
Number of lanes, N	2	
Density, D	29.7	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Basic Freeway Segments Release 6.50

Phone: Fax:
E-mail:

Operational Analysis

Analyst: JM
Agency or Company: Stantec
Date Performed: 11/9/2018
Analysis Time Period: PM
Freeway/Direction: WB
From/To: West of SC 453
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Flow Inputs and Adjustments

Volume, V	3424	veh/h
Peak-hour factor, PHF	0.93	
Peak 15-min volume, v15	920	v
Trucks and buses	15	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.930	
Driver population factor, fp	1.00	
Flow rate, vp	1979	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	1.00	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	3.2	mi/h
Free-flow speed, FFS	72.2	mi/h

LOS and Performance Measures

Flow rate, vp	1979	pc/h/ln
Free-flow speed, FFS	72.2	mi/h
Average passenger-car speed, S	63.0	mi/h
Number of lanes, N	2	
Density, D	31.4	pc/mi/ln
Level of service, LOS	D	

Overall results are not computed when free-flow speed is less than 55 mph.

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: SC 453
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2567	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	194	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	37	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2567	194	37	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v_{15}	698	54	10	v
Trucks and buses	10	24	52	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.893	0.794	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	2930	241	52	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)

EQ

$P = 1.000$ Using Equation 0

FM

$v_{12} = v_{12} (P) = 2930$ pc/h

FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	3171	4800	No
FO			
v_{12} or v_{12}	0 pc/h	(Equation 13-14 or 13-17)	
$\frac{v_{12}}{3}$ av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
$\frac{v_{12}}{3}$ av34			
Is v_{12} or v_{12}	$> 1.5 \frac{v_{12}}{12}$	No	
$\frac{v_{12}}{3}$ av34			
If yes, $v_{12} = 2930$	(Equation 13-15, 13-16, 13-18, or 13-19)		
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3171	4600	No
R12			

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 \frac{v_{12}}{R} + 0.0078 \frac{v_{12}}{A} - 0.00627 L = 25.1$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, $M = 0.358$

S

Space mean speed in ramp influence area, $S = 60.0$ mph

R

Space mean speed in outer lanes, $S = N/A$ mph

0

Space mean speed for all vehicles, $S = 60.0$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2583	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	686	vph
Length of first accel/decel lane	900	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	178	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2300	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	2583	686	178	vph
Peak-hour factor, PHF	0.92	0.90	0.90	

Peak 15-min volume, v ₁₅	702	191	49	v
Trucks and buses	10	7	8	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.952	0.966	0.962	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	2948	789	206	pcph

Estimation of V12 Merge Areas

$$L = 627.52 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.603 \text{ Using Equation 1}$$

FM

$$v = v(P) = 1777 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v	3737	7200	No
FO			
v or v ₃	1171 pc/h	(Equation 13-14 or 13-17)	
av ₃₄			
Is v or v ₃	> 2700 pc/h?	No	
av ₃₄			
Is v or v ₃	> 1.5 v / 2	Yes	
av ₃₄	12		
If yes, v _{12A}	= 1777	(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v	2566	4600	No
12A			

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_R + 0.0078 v_A - 0.00627 L = 19.5 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, M = 0.309

S

Space mean speed in ramp influence area, S = 61.4 mph

R

Space mean speed in outer lanes, S = 67.6 mph

0

Space mean speed for all vehicles, S = 63.2 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3183	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-flow speed on ramp	35.0	mph
Volume on ramp	623	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane	1500	ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	86	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	3500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3183	623	86	vph
Peak-hour factor, PHF	0.92	0.92	0.92	

Peak 15-min volume, v_{15}	865	169	23	v
Trucks and buses	10	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.952	0.952	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3633	711	98	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 13-6 or 13-7)

EQ

$P = 0.555$ Using Equation 0

FM

$v_{12} = v_{12} (P) = 2016$ pc/h

12 F FM

Capacity Checks

v_{12}	Actual 4344	Maximum 7200	LOS F? No
FO			
v_{12} or v_{12}	1617 pc/h	(Equation 13-14 or 13-17)	
3 av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
3 av34			
Is v_{12} or v_{12}	> 1.5 $v_{12} / 2$	Yes	
3 av34	12		
If yes, v_{12}	= 2076	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

v_{12}	Actual 2787	Max Desirable 4600	Violation? No
12A			

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = -1.3$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence A

Speed Estimation

Intermediate speed variable, $M = 0.069$

S

Space mean speed in ramp influence area, $S = 68.1$ mph

R

Space mean speed in outer lanes, $S = 66.2$ mph

0

Space mean speed for all vehicles, $S = 67.4$ mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: EB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3604	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	824	vph
Length of first accel/decel lane	1120	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	202	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2900	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3604	824	202	vph
Peak-hour factor, PHF	0.92	0.90	0.91	

Peak 15-min volume, v_{15}	979	229	55	v
Trucks and buses	10	7	19	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.952	0.966	0.913	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	4113	948	243	pcph

Estimation of V12 Merge Areas

$$L = 1008.53 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.609 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 2504 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	5061	7200	No
FO			
v_{12} or v_{12}	1609 pc/h	(Equation 13-14 or 13-17)	
$\frac{v_{12}}{3}$ av34			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
$\frac{v_{12}}{3}$ av34			
Is v_{12} or v_{12}	> 1.5 $v_{12} / 2$	Yes	
$\frac{v_{12}}{3}$ av34	12		
If yes, v_{12}	= 2504	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	3452	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 \frac{v_{12}}{R} + 0.0078 \frac{v_{12}}{A} - 0.00627 L = 24.9 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

$$\text{Intermediate speed variable, } M = 0.366$$

S

$$\text{Space mean speed in ramp influence area, } S_R = 59.8 \text{ mph}$$

R

$$\text{Space mean speed in outer lanes, } S_0 = 66.0 \text{ mph}$$

0

$$\text{Space mean speed for all vehicles, } S = 61.6 \text{ mph}$$

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: Jedburg
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	4013	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	198	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	802	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	750	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	4013	198	802	vph
Peak-hour factor, PHF	0.93	0.90	0.95	

Peak 15-min volume, v ₁₅	1079	55	211	v
Trucks and buses	15	7	6	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.930	0.966	0.971	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	4639	228	870	pcph

Estimation of V12 Merge Areas

$$L = 1135.74 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.595 \text{ Using Equation 2}$$

FM

$$v_{12} = v_{15} (P)^{1/2} = 2761 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v ₁₂	4867	7200	No
FO			
v ₃ or v _{av34}	1878 pc/h	(Equation 13-14 or 13-17)	
Is v ₃ or v _{av34} > 2700 pc/h?		No	
Is v ₃ or v _{av34} > 1.5 v ₁₂ / 2		Yes	
If yes, v _{12A} = 2761		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v _{12A}	2989	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_A - 0.00627 L = 19.3 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

$$\text{Intermediate speed variable, } M = 0.293$$

S

$$\text{Space mean speed in ramp influence area, } S_R = 61.8 \text{ mph}$$

R

$$\text{Space mean speed in outer lanes, } S_0 = 65.0 \text{ mph}$$

0

$$\text{Space mean speed for all vehicles, } S = 63.0 \text{ mph}$$

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: Volvo
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3864	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	156	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	347	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2400	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3864	156	347	vph
Peak-hour factor, PHF	0.93	0.92	0.92	

Peak 15-min volume, v ₁₅	1039	42	94	v
Trucks and buses	15	10	10	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.930	0.952	0.952	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	4466	178	396	pcph

Estimation of V₁₂ Merge Areas

$$L = 1088.02 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.619 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 2767 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v	4644	7200	No
FO			
v or v ₃	1699 pc/h	(Equation 13-14 or 13-17)	
av ₃₄			
Is v or v ₃	> 2700 pc/h?	No	
av ₃₄			
Is v or v ₃	> 1.5 v ₁₂ / 2	Yes	
av ₃₄	12		
If yes, v _{12A}	= 2767	(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v	2945	4600	No
12A			

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_A - 0.00627 L = 19.0 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, M = 0.290

S

Space mean speed in ramp influence area, S = 61.9 mph

R

Space mean speed in outer lanes, S = 65.7 mph

0

Space mean speed for all vehicles, S = 63.2 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3348	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	205	vph
Length of first accel/decel lane	900	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	672	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2500	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3348	205	672	vph
Peak-hour factor, PHF	0.93	0.90	0.91	

Peak 15-min volume, v_{15}	900	57	185	v
Trucks and buses	15	7	7	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.930	0.966	0.966	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, v_p	3870	236	764	pcph

Estimation of V12 Merge Areas

$$L = 706.48 \text{ (Equation 13-6 or 13-7)}$$

EQ

$$P = 0.603 \text{ Using Equation 1}$$

FM

$$v_{12} = v_{12} (P) = 2332 \text{ pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v_{12}	4106	7200	No
FO			
v_{12} or v_{12}	1538 pc/h	(Equation 13-14 or 13-17)	
v_{12} or v_{12}			
Is v_{12} or v_{12}	> 2700 pc/h?	No	
v_{12} or v_{12}			
Is v_{12} or v_{12}	> 1.5 v_{12} / 2	Yes	
v_{12} or v_{12}			
If yes, v_{12}	= 2332	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2568	4600	No
12A			

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_{12} + 0.0078 v_{12} - 0.00627 L = 19.8 \text{ pc/mi/ln}$$

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $M = 0.309$

S

Space mean speed in ramp influence area, $S = 61.4 \text{ mph}$

R

Space mean speed in outer lanes, $S = 66.3 \text{ mph}$

0

Space mean speed for all vehicles, $S = 63.1 \text{ mph}$

HCS 2010: Freeway Merge and Diverge Segments Release 6.50

Phone: Fax:
E-mail:

Merge Analysis

Analyst: JM
Agency/Co.: Stantec
Date performed: 11/12/2018
Analysis time period: PM
Freeway/Dir of Travel: WB
Junction: SC 27
Jurisdiction: SCDOT
Analysis Year: 2043
Description: 171001994

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3355	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	69	vph
Length of first accel/decel lane	800	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	198	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1850	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent	
		Ramp		
Volume, V (vph)	3355	69	198	vph
Peak-hour factor, PHF	0.93	0.90	0.90	

Peak 15-min volume, v ₁₅	902	19	55	v
Trucks and buses	15	24	21	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, f _{HV}	0.930	0.893	0.905	
Driver population factor, f _P	1.00	1.00	1.00	
Flow rate, v _p	3878	86	243	pcph

Estimation of V₁₂ Merge Areas

L = (Equation 13-6 or 13-7)

EQ

P = 1.000 Using Equation 0

FM

v = v₁₂ (P) = 3878 pc/h

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v	3964	4800	No
FO			
v or v ₃	0 pc/h	(Equation 13-14 or 13-17)	
av ₃₄			
Is v or v ₃	> 2700 pc/h?	No	
av ₃₄			
Is v or v ₃	> 1.5 v ₁₂ / 2	No	
av ₃₄	12		
If yes, v _{12A}	= 3878	(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v	3964	4600	No
R ₁₂			

Level of Service Determination (if not F)

Density, D = $5.475 + 0.00734 v_R + 0.0078 v_A - 0.00627 L$ = 31.3 pc/mi/ln

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable, M = 0.470

S

Space mean speed in ramp influence area, S = 56.8 mph

R

Space mean speed in outer lanes, S = N/A mph

0

Space mean speed for all vehicles, S = 56.8 mph

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Jedburg Road (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.95
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 718 veh/h
Opposing direction volume, Vo 521 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.2
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.993	0.986
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	761 pc/h	556 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	2.0	mi/h
Average travel speed, ATSD	31.3	mi/h
Percent Free Flow Speed, PFFS	71.9	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	756 pc/h	548 pc/h
Base percent time-spent-following,(note-4) BPTSFd	65.1	%
Adjustment for no-passing zones, fnp	29.9	
Percent time-spent-following, PTSFd	82.4	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.45
Peak 15-min vehicle-miles of travel, VMT15	189 veh-mi
Peak-hour vehicle-miles of travel, VMT60	718 veh-mi
Peak 15-min total travel time, TT15	6.0 veh-h
Capacity from ATS, CdATS	1676 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1676 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	31.3	mi/h
Percent time-spent-following, PTSFd (from above)	82.4	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 755.8
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 6.08
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Jedburg Road (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	60 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 877 veh/h
Opposing direction volume, Vo 1069 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	1.000	1.000
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	953 pc/h	1162 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	0.6	mi/h
Average travel speed, ATSD	26.5	mi/h
Percent Free Flow Speed, PFFS	60.9	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	953 pc/h	1162 pc/h
Base percent time-spent-following,(note-4) BPTSFd	78.4	%
Adjustment for no-passing zones, fnp	15.3	
Percent time-spent-following, PTSFd	85.3	%

Level of Service and Other Performance Measures

Level of service, LOS	E
Volume to capacity ratio, v/c	0.56
Peak 15-min vehicle-miles of travel, VMT15	238 veh-mi
Peak-hour vehicle-miles of travel, VMT60	877 veh-mi
Peak 15-min total travel time, TT15	9.0 veh-h
Capacity from ATS, CdATS	1700 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1700 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	26.5	mi/h
Percent time-spent-following, PTSFd (from above)	85.3	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 953.3
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 6.20
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Volvo Car Drive (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	6.0 ft	% Trucks and buses	10 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	20 %
Up/down	- %	Access point density	8 /mi

Analysis direction volume, Vd 433 veh/h
Opposing direction volume, Vo 779 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.2	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.980	0.990
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	480 pc/h	855 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 0.0 mi/h
Adj. for access point density,(note-3) fA 2.0 mi/h

Free-flow speed, FFSd	48.0	mi/h
Adjustment for no-passing zones, fnp	0.4	mi/h
Average travel speed, ATSD	37.3	mi/h
Percent Free Flow Speed, PFFS	77.7	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	471 pc/h	847 pc/h
Base percent time-spent-following,(note-4) BPTSFd	53.7	%
Adjustment for no-passing zones, fnp	18.3	
Percent time-spent-following, PTSFd	60.2	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.28
Peak 15-min vehicle-miles of travel, VMT15	118 veh-mi
Peak-hour vehicle-miles of travel, VMT60	433 veh-mi
Peak 15-min total travel time, TT15	3.2 veh-h
Capacity from ATS, CdATS	1683 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1683 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	37.3	mi/h
Percent time-spent-following, PTSFd (from above)	60.2	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 470.7
Effective width of outside lane, We 24.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.06
Bicycle LOS E

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 27 (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	7 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	30 /mi

Analysis direction volume, Vd 597 veh/h
Opposing direction volume, Vo 769 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.993	1.000
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	668 pc/h	854 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 7.5 mi/h

Free-flow speed, FFSd	43.3	mi/h
Adjustment for no-passing zones, fnp	1.2	mi/h
Average travel speed, ATSD	30.3	mi/h
Percent Free Flow Speed, PFFS	70.0	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	663 pc/h	854 pc/h
Base percent time-spent-following,(note-4) BPTSFd	64.1	%
Adjustment for no-passing zones, fnp	25.8	
Percent time-spent-following, PTSFd	75.4	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.39
Peak 15-min vehicle-miles of travel, VMT15	166 veh-mi
Peak-hour vehicle-miles of travel, VMT60	597 veh-mi
Peak 15-min total travel time, TT15	5.5 veh-h
Capacity from ATS, CdATS	1700 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1700 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	30.3	mi/h
Percent time-spent-following, PTSFd (from above)	75.4	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 663.3
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 6.15
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 27 (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	10 /mi

Analysis direction volume, Vd 547 veh/h
Opposing direction volume, Vo 667 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.993	0.993
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	612 pc/h	746 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 2.5 mi/h

Free-flow speed, FFSd	49.5	mi/h
Adjustment for no-passing zones, fnp	1.5	mi/h
Average travel speed, ATSD	37.5	mi/h
Percent Free Flow Speed, PFFS	75.8	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	608 pc/h	741 pc/h
Base percent time-spent-following,(note-4) BPTSFd	60.0	%
Adjustment for no-passing zones, fnp	29.3	
Percent time-spent-following, PTSFd	73.2	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.36
Peak 15-min vehicle-miles of travel, VMT15	152 veh-mi
Peak-hour vehicle-miles of travel, VMT60	547 veh-mi
Peak 15-min total travel time, TT15	4.1 veh-h
Capacity from ATS, CdATS	1688 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1688 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	37.5	mi/h
Percent time-spent-following, PTSFd (from above)	73.2	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 607.8
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.97
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 453 (NB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	24 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	75 %
Up/down	- %	Access point density	4 /mi

Analysis direction volume, Vd 186 veh/h
Opposing direction volume, Vo 214 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.5	1.5
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.893	0.893
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	231 pc/h	266 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.7 mi/h
Adj. for access point density,(note-3) fA 1.0 mi/h

Free-flow speed, FFSd	39.3	mi/h
Adjustment for no-passing zones, fnp	3.2	mi/h
Average travel speed, ATSD	32.2	mi/h
Percent Free Flow Speed, PFFS	82.0	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.977	0.977
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	212 pc/h	243 pc/h
Base percent time-spent-following,(note-4) BPTSFd	24.2	%
Adjustment for no-passing zones, fnp	58.5	
Percent time-spent-following, PTSFd	51.5	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.14
Peak 15-min vehicle-miles of travel, VMT15	52 veh-mi
Peak-hour vehicle-miles of travel, VMT60	186 veh-mi
Peak 15-min total travel time, TT15	1.6 veh-h
Capacity from ATS, CdATS	1518 veh/h
Capacity from PTSF, CdPTSF	1660 veh/h
Directional Capacity	1518 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.2	mi/h
Percent time-spent-following, PTSFd (from above)	51.5	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 206.7
Effective width of outside lane, We 12.50
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 14.44
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 453 (NB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	24 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	70 %
Up/down	- %	Access point density	16 /mi

Analysis direction volume, Vd 202 veh/h
Opposing direction volume, Vo 288 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.5	1.4
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.893	0.912
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	251 pc/h	351 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 4.0 mi/h

Free-flow speed, FFSd	36.8	mi/h
Adjustment for no-passing zones, fnp	2.5	mi/h
Average travel speed, ATSD	29.6	mi/h
Percent Free Flow Speed, PFFS	80.4	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.977	0.977
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	230 pc/h	328 pc/h
Base percent time-spent-following,(note-4) BPTSFd	27.2	%
Adjustment for no-passing zones, fnp	52.9	
Percent time-spent-following, PTSFd	49.0	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.15
Peak 15-min vehicle-miles of travel, VMT15	56 veh-mi
Peak-hour vehicle-miles of travel, VMT60	202 veh-mi
Peak 15-min total travel time, TT15	1.9 veh-h
Capacity from ATS, CdATS	1550 veh/h
Capacity from PTSF, CdPTSF	1660 veh/h
Directional Capacity	1550 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	29.6	mi/h
Percent time-spent-following, PTSFd (from above)	49.0	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 224.4
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 14.42
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Jedburg Road (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.95
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 521 veh/h
Opposing direction volume, Vo 718 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.2	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.986	0.993
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	556 pc/h	761 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	1.3	mi/h
Average travel speed, ATSD	32.0	mi/h
Percent Free Flow Speed, PFFS	73.5	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	548 pc/h	756 pc/h
Base percent time-spent-following,(note-4) BPTSFd	57.0	%
Adjustment for no-passing zones, fnp	29.9	
Percent time-spent-following, PTSFd	69.6	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.33
Peak 15-min vehicle-miles of travel, VMT15	137 veh-mi
Peak-hour vehicle-miles of travel, VMT60	521 veh-mi
Peak 15-min total travel time, TT15	4.3 veh-h
Capacity from ATS, CdATS	1688 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1688 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.0	mi/h
Percent time-spent-following, PTSFd (from above)	69.6	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 548.4
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.92
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Jedburg Road (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	60 %
Up/down	- %	Access point density	14 /mi

Analysis direction volume, Vd 1069 veh/h
Opposing direction volume, Vo 877 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	1.000	1.000
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	1162 pc/h	953 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 3.5 mi/h

Free-flow speed, FFSd	43.5	mi/h
Adjustment for no-passing zones, fnp	0.6	mi/h
Average travel speed, ATSD	26.4	mi/h
Percent Free Flow Speed, PFFS	60.8	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	1162 pc/h	953 pc/h
Base percent time-spent-following,(note-4) BPTSFd	81.4	%
Adjustment for no-passing zones, fnp	15.3	
Percent time-spent-following, PTSFd	89.8	%

Level of Service and Other Performance Measures

Level of service, LOS	E
Volume to capacity ratio, v/c	0.68
Peak 15-min vehicle-miles of travel, VMT15	290 veh-mi
Peak-hour vehicle-miles of travel, VMT60	1069 veh-mi
Peak 15-min total travel time, TT15	11.0 veh-h
Capacity from ATS, CdATS	1700 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1700 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	26.4	mi/h
Percent time-spent-following, PTSFd (from above)	89.8	
Level of service, LOSd (from above)	E	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 1162.0
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 6.30
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway Volvo Car Drive (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.92
Shoulder width	6.0 ft	% Trucks and buses	10 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	20 %
Up/down	- %	Access point density	8 /mi

Analysis direction volume, Vd 779 veh/h
Opposing direction volume, Vo 433 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.2
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.990	0.980
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	855 pc/h	480 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 50.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 0.0 mi/h
Adj. for access point density,(note-3) fA 2.0 mi/h

Free-flow speed, FFSd	48.0	mi/h
Adjustment for no-passing zones, fnp	0.8	mi/h
Average travel speed, ATSD	36.8	mi/h
Percent Free Flow Speed, PFFS	76.7	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	847 pc/h	471 pc/h
Base percent time-spent-following,(note-4) BPTSFd	68.4	%
Adjustment for no-passing zones, fnp	18.3	
Percent time-spent-following, PTSFd	80.2	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.50
Peak 15-min vehicle-miles of travel, VMT15	212 veh-mi
Peak-hour vehicle-miles of travel, VMT60	779 veh-mi
Peak 15-min total travel time, TT15	5.8 veh-h
Capacity from ATS, CdATS	1666 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1666 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	36.8	mi/h
Percent time-spent-following, PTSFd (from above)	80.2	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 846.7
Effective width of outside lane, We 24.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 5.36
Bicycle LOS E

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 27 (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	7 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	30 /mi

Analysis direction volume, Vd 769 veh/h
Opposing direction volume, Vo 597 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	1.000	0.993
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	854 pc/h	668 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 7.5 mi/h

Free-flow speed, FFSd	43.3	mi/h
Adjustment for no-passing zones, fnp	1.6	mi/h
Average travel speed, ATSD	29.9	mi/h
Percent Free Flow Speed, PFFS	69.0	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	854 pc/h	663 pc/h
Base percent time-spent-following,(note-4) BPTSFd	70.2	%
Adjustment for no-passing zones, fnp	25.8	
Percent time-spent-following, PTSFd	84.7	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.50
Peak 15-min vehicle-miles of travel, VMT15	214 veh-mi
Peak-hour vehicle-miles of travel, VMT60	769 veh-mi
Peak 15-min total travel time, TT15	7.2 veh-h
Capacity from ATS, CdATS	1688 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1688 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	29.9	mi/h
Percent time-spent-following, PTSFd (from above)	84.7	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 854.4
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 6.27
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
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Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 27 (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	2.5 ft	% Trucks and buses	7 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	100 %
Up/down	- %	Access point density	10 /mi

Analysis direction volume, Vd 667 veh/h
Opposing direction volume, Vo 547 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.993	0.993
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	746 pc/h	612 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 55.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 3.0 mi/h
Adj. for access point density,(note-3) fA 2.5 mi/h

Free-flow speed, FFSd	49.5	mi/h
Adjustment for no-passing zones, fnp	1.9	mi/h
Average travel speed, ATSD	37.1	mi/h
Percent Free Flow Speed, PFFS	75.0	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.0	1.0
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	1.000	1.000
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	741 pc/h	608 pc/h
Base percent time-spent-following,(note-4) BPTSFd	64.3	%
Adjustment for no-passing zones, fnp	29.3	
Percent time-spent-following, PTSFd	80.4	%

Level of Service and Other Performance Measures

Level of service, LOS	D
Volume to capacity ratio, v/c	0.44
Peak 15-min vehicle-miles of travel, VMT15	185 veh-mi
Peak-hour vehicle-miles of travel, VMT60	667 veh-mi
Peak 15-min total travel time, TT15	5.0 veh-h
Capacity from ATS, CdATS	1688 veh/h
Capacity from PTSF, CdPTSF	1700 veh/h
Directional Capacity	1688 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	37.1	mi/h
Percent time-spent-following, PTSFd (from above)	80.4	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 741.1
Effective width of outside lane, We 14.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 6.07
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 453 (SB)
From/To North of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	24 %
Lane width	11.5 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	75 %
Up/down	- %	Access point density	4 /mi

Analysis direction volume, Vd 214 veh/h
Opposing direction volume, Vo 186 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.5	1.5
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.893	0.893
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	266 pc/h	231 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.7 mi/h
Adj. for access point density,(note-3) fA 1.0 mi/h

Free-flow speed, FFSd	39.3	mi/h
Adjustment for no-passing zones, fnp	3.4	mi/h
Average travel speed, ATSD	32.0	mi/h
Percent Free Flow Speed, PFFS	81.5	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.977	0.977
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	243 pc/h	212 pc/h
Base percent time-spent-following,(note-4) BPTSFd	25.1	%
Adjustment for no-passing zones, fnp	58.5	
Percent time-spent-following, PTSFd	56.3	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.16
Peak 15-min vehicle-miles of travel, VMT15	59 veh-mi
Peak-hour vehicle-miles of travel, VMT60	214 veh-mi
Peak 15-min total travel time, TT15	1.8 veh-h
Capacity from ATS, CdATS	1518 veh/h
Capacity from PTSF, CdPTSF	1660 veh/h
Directional Capacity	1518 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	32.0	mi/h
Percent time-spent-following, PTSFd (from above)	56.3	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 237.8
Effective width of outside lane, We 12.50
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 14.51
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.50

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst JM
Agency/Co. Stantec
Date Performed 11/14/2018
Analysis Time Period PM
Highway SC 453 (SB)
From/To South of I-26
Jurisdiction SCDOT
Analysis Year 2043
Description 171001994

Input Data

Highway class	Class 3	Peak hour factor, PHF	0.90
Shoulder width	1.0 ft	% Trucks and buses	24 %
Lane width	12.0 ft	% Trucks crawling	0.0 %
Segment length	1.0 mi	Truck crawl speed	0.0 mi/hr
Terrain type	Level	% Recreational vehicles	0 %
Grade: Length	- mi	% No-passing zones	70 %
Up/down	- %	Access point density	16 /mi

Analysis direction volume, Vd 288 veh/h
Opposing direction volume, Vo 202 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.4	1.5
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adj. factor,(note-5) fHV	0.912	0.893
Grade adj. factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	351 pc/h	251 pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS 45.0 mi/h
Adj. for lane and shoulder width,(note-3) fLS 4.2 mi/h
Adj. for access point density,(note-3) fA 4.0 mi/h

Free-flow speed, FFSd	36.8	mi/h
Adjustment for no-passing zones, fnp	3.1	mi/h
Average travel speed, ATSD	29.0	mi/h
Percent Free Flow Speed, PFFS	78.8	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.1	1.1
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.977	0.977
Grade adjustment factor,(note-1) fg	1.00	1.00
Directional flow rate,(note-2) vi	328 pc/h	230 pc/h
Base percent time-spent-following,(note-4) BPTSFd	33.1	%
Adjustment for no-passing zones, fnp	52.9	
Percent time-spent-following, PTSFd	64.2	%

Level of Service and Other Performance Measures

Level of service, LOS	C
Volume to capacity ratio, v/c	0.21
Peak 15-min vehicle-miles of travel, VMT15	80 veh-mi
Peak-hour vehicle-miles of travel, VMT60	288 veh-mi
Peak 15-min total travel time, TT15	2.8 veh-h
Capacity from ATS, CdATS	1518 veh/h
Capacity from PTSF, CdPTSF	1660 veh/h
Directional Capacity	1518 veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSD (from above)	29.0	mi/h
Percent time-spent-following, PTSFd (from above)	64.2	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length
of passing lane for percent time-spent-following, Lde - mi
Length of two-lane highway downstream of effective length of
the passing lane for percent time-spent-following, Ld - mi
Adj. factor for the effect of passing lane
on percent time-spent-following, fpl -
Percent time-spent-following
including passing lane, PTSFpl - %

_____Level of Service and Other Performance Measures with Passing Lane _____

Level of service including passing lane, LOSpl E
Peak 15-min total travel time, TT15 - veh-h

_____ Bicycle Level of Service _____

Posted speed limit, Sp 55
Percent of segment with occupied on-highway parking 0
Pavement rating, P 3
Flow rate in outside lane, vOL 320.0
Effective width of outside lane, We 13.00
Effective speed factor, St 4.79
Bicycle LOS Score, BLOS 14.60
Bicycle LOS F

Notes:

1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i (v_d or v_o) $\geq 1,700$ pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for $v > 200$ veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

June 2019










Appendix D INTERSECTION ANALYSIS RESULTS

D.1 2018 EXISTING



HCM 2010 TWSC
1: Jedburg Road & Old Dairy Road

2018 Existing Conditions
AM Peak Hour

Intersection												
Int Delay, s/veh	25											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	79	3	34	8	6	82	28	677	18	116	455	87
Future Vol, veh/h	79	3	34	8	6	82	28	677	18	116	455	87
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Yield	-	-	None	-	-	None
Storage Length	0	-	250	225	-	-	175	-	-	125	-	125
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	34	34	34	34	34	34	11	11	11	11	11	11
Mvmt Flow	83	3	36	8	6	86	29	713	19	122	479	92

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1507	1513	479	1570	1596	723	571	0	0	732	0	0
Stage 1	723	723	-	781	781	-	-	-	-	-	-	-
Stage 2	784	790	-	789	815	-	-	-	-	-	-	-
Critical Hdwy	7.44	6.84	6.54	7.44	6.84	6.54	4.21	-	-	4.21	-	-
Critical Hdwy Stg 1	6.44	5.84	-	6.44	5.84	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.44	5.84	-	6.44	5.84	-	-	-	-	-	-	-
Follow-up Hdwy	3.806	4.306	3.606	3.806	4.306	3.606	2.299	-	-	2.299	-	-
Pot Cap-1 Maneuver	84	102	526	76	90	377	958	-	-	833	-	-
Stage 1	371	387	-	344	362	-	-	-	-	-	-	-
Stage 2	342	359	-	340	349	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	~ 53	84	526	60	75	377	958	-	-	833	-	-
Mov Cap-2 Maneuver	~ 53	84	-	60	75	-	-	-	-	-	-	-
Stage 1	360	330	-	334	351	-	-	-	-	-	-	-
Stage 2	251	348	-	268	298	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s\$	314.7	20.2	0.3	1.8
HCM LOS	F	C		



















Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	958	-	-	53	369	60	441	833	-	-
HCM Lane V/C Ratio	0.031	-	-	1.569	0.106	0.14	0.21	0.147	-	-
HCM Control Delay (s)	8.9	-	-	\$ 454.6	15.9	74.6	15.3	10.1	-	-
HCM Lane LOS	A	-	-	F	C	F	C	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	7.8	0.4	0.5	0.8	0.5	-	-

Notes												
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon						

HCM 2010 Signalized Intersection Summary

2: Jedburg Road & I-26 EB Ramps


















2018 Existing Conditions
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	0	114	0	0	0	0	293	545	259	544	0
Future Volume (veh/h)	20	0	114	0	0	0	0	293	545	259	544	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1473	1473				0	1712	1712	1712	1712	0
Adj Flow Rate, veh/h	21	0	119				0	305	568	270	567	0
Adj No. of Lanes	0	1	1				0	1	1	1	1	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	29	29	29				0	11	11	11	11	0
Cap, veh/h	181	0	161				0	815	693	508	1170	0
Arrive On Green	0.13	0.00	0.13				0.00	0.48	0.48	0.11	0.68	0.00
Sat Flow, veh/h	1403	0	1252				0	1712	1455	1630	1712	0
Grp Volume(v), veh/h	21	0	119				0	305	568	270	567	0
Grp Sat Flow(s),veh/h/ln	1403	0	1252				0	1712	1455	1630	1712	0
Q Serve(g_s), s	0.8	0.0	5.8				0.0	7.3	21.4	4.8	10.0	0.0
Cycle Q Clear(g_c), s	0.8	0.0	5.8				0.0	7.3	21.4	4.8	10.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	181	0	161				0	815	693	508	1170	0
V/C Ratio(X)	0.12	0.00	0.74				0.00	0.37	0.82	0.53	0.48	0.00
Avail Cap(c_a), veh/h	351	0	313				0	1125	956	681	1661	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	24.6	0.0	26.8				0.0	10.7	14.4	6.8	4.8	0.0
Incr Delay (d2), s/veh	0.3	0.0	6.4				0.0	0.3	4.1	0.9	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	2.3				0.0	3.5	9.3	2.2	4.7	0.0
LnGrp Delay(d),s/veh	24.9	0.0	33.2				0.0	10.9	18.5	7.6	5.1	0.0
LnGrp LOS	C		C					B	B	A	A	
Approach Vol, veh/h		140						873			837	
Approach Delay, s/veh		32.0						15.8			5.9	
Approach LOS		C						B			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	13.2	36.4		14.2		49.7						
Change Period (Y+Rc), s	6.0	6.0		6.0		6.0						
Max Green Setting (Gmax), s	14.0	42.0		16.0		62.0						
Max Q Clear Time (g_c+I1), s	6.8	23.4		7.8		12.0						
Green Ext Time (p_c), s	0.5	7.0		0.4		16.6						
Intersection Summary												
HCM 2010 Ctrl Delay			12.6									
HCM 2010 LOS			B									

HCM 2010 Signalized Intersection Summary








3: Jedburg Road & I-26 WB Ramps




2018 Existing Conditions
AM Peak Hour




												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	294	0	141	61	252	0	0	509	79
Future Volume (veh/h)	0	0	0	294	0	141	61	252	0	0	509	79
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1900	1727	1727	1712	1712	0	0	1712	1900
Adj Flow Rate, veh/h				309	0	148	64	265	0	0	536	83
Adj No. of Lanes				0	1	1	1	1	0	0	1	0
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				10	10	10	11	11	0	0	11	11
Cap, veh/h				397	0	354	284	1019	0	0	686	106
Arrive On Green				0.24	0.00	0.24	0.04	0.60	0.00	0.00	0.47	0.47
Sat Flow, veh/h				1645	0	1468	1630	1712	0	0	1448	224
Grp Volume(v), veh/h				309	0	148	64	265	0	0	0	619
Grp Sat Flow(s),veh/h/ln				1645	0	1468	1630	1712	0	0	0	1672
Q Serve(g_s), s				12.9	0.0	6.2	1.4	5.4	0.0	0.0	0.0	22.7
Cycle Q Clear(g_c), s				12.9	0.0	6.2	1.4	5.4	0.0	0.0	0.0	22.7
Prop In Lane				1.00		1.00	1.00		0.00	0.00		0.13
Lane Grp Cap(c), veh/h				397	0	354	284	1019	0	0	0	792
V/C Ratio(X)				0.78	0.00	0.42	0.23	0.26	0.00	0.00	0.00	0.78
Avail Cap(c_a), veh/h				471	0	420	419	1330	0	0	0	957
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh				26.0	0.0	23.5	12.6	7.1	0.0	0.0	0.0	16.1
Incr Delay (d2), s/veh				6.9	0.0	0.8	0.4	0.1	0.0	0.0	0.0	3.5
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				6.6	0.0	2.6	0.6	2.5	0.0	0.0	0.0	11.1
LnGrp Delay(d),s/veh				32.9	0.0	24.3	13.0	7.2	0.0	0.0	0.0	19.6
LnGrp LOS				C		C	B	A				B
Approach Vol, veh/h					457			329			619	
Approach Delay, s/veh					30.1			8.4			19.6	
Approach LOS					C			A			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		49.7			8.9	40.8		23.7				
Change Period (Y+Rc), s		6.0			6.0	6.0		6.0				
Max Green Setting (Gmax), s		57.0			9.0	42.0		21.0				
Max Q Clear Time (g_c+I1), s		7.4			3.4	24.7		14.9				
Green Ext Time (p_c), s		6.3			0.0	10.1		2.8				
Intersection Summary												
HCM 2010 Ctrl Delay				20.4								
HCM 2010 LOS				C								

HCM 2010 TWSC
4: Jedburg Road & Drop Off Drive

2018 Existing Conditions
AM Peak Hour

Intersection												
Int Delay, s/veh	5.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	31	8	87	46	13	13	51	283	59	17	455	51
Future Vol, veh/h	31	8	87	46	13	13	51	283	59	17	455	51
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	175	-	-	175	-	-	175	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	22	22	22	22	22	22	11	11	11	11	11	11
Mvmt Flow	33	9	93	49	14	14	54	301	63	18	484	54
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1002	1019	511	1039	1015	333	538	0	0	364	0	0
Stage 1	547	547	-	441	441	-	-	-	-	-	-	-
Stage 2	455	472	-	598	574	-	-	-	-	-	-	-
Critical Hdwy	7.32	6.72	6.42	7.32	6.72	6.42	4.21	-	-	4.21	-	-
Critical Hdwy Stg 1	6.32	5.72	-	6.32	5.72	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.32	5.72	-	6.32	5.72	-	-	-	-	-	-	-
Follow-up Hdwy	3.698	4.198	3.498	3.698	4.198	3.498	2.299	-	-	2.299	-	-
Pot Cap-1 Maneuver	203	219	525	191	220	665	986	-	-	1147	-	-
Stage 1	487	486	-	558	544	-	-	-	-	-	-	-
Stage 2	548	527	-	456	473	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	179	204	525	144	205	665	986	-	-	1147	-	-
Mov Cap-2 Maneuver	179	204	-	144	205	-	-	-	-	-	-	-
Stage 1	460	478	-	527	514	-	-	-	-	-	-	-
Stage 2	494	498	-	363	465	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	22.9		33.4		1.2		0.3					
HCM LOS	C		D									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1WBLn2	SBL	SBT	SBR					
Capacity (veh/h)	986	-	-	333	144	313	1147	-	-			
HCM Lane V/C Ratio	0.055	-	-	0.403	0.34	0.088	0.016	-	-			
HCM Control Delay (s)	8.9	-	-	22.9	42.4	17.6	8.2	-	-			
HCM Lane LOS	A	-	-	C	E	C	A	-	-			
HCM 95th %tile Q(veh)	0.2	-	-	1.9	1.4	0.3	0	-	-			

Intersection						
Int Delay, s/veh	0					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	0	382	1	0	348
Future Vol, veh/h	2	0	382	1	0	348
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	16	16	16	16
Mvmt Flow	2	0	424	1	0	387
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	812	425	0	0	425	0
Stage 1	425	-	-	-	-	-
Stage 2	387	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.26	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.344	-
Pot Cap-1 Maneuver	348	629	-	-	1063	-
Stage 1	659	-	-	-	-	-
Stage 2	686	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	348	629	-	-	1063	-
Mov Cap-2 Maneuver	348	-	-	-	-	-
Stage 1	659	-	-	-	-	-
Stage 2	686	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	15.4	0		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	-	348	1063	-	
HCM Lane V/C Ratio	-	-	0.006	-	-	
HCM Control Delay (s)	-	-	15.4	0	-	
HCM Lane LOS	-	-	C	A	-	
HCM 95th %tile Q(veh)	-	-	0	0	-	

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	1	0	382	347	3
Future Vol, veh/h	1	1	0	382	347	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	50	50	16	16	16	16
Mvmt Flow	1	1	0	420	381	3
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	803	383	384	0	-	0
Stage 1	383	-	-	-	-	-
Stage 2	420	-	-	-	-	-
Critical Hdwy	6.9	6.7	4.26	-	-	-
Critical Hdwy Stg 1	5.9	-	-	-	-	-
Critical Hdwy Stg 2	5.9	-	-	-	-	-
Follow-up Hdwy	3.95	3.75	2.344	-	-	-
Pot Cap-1 Maneuver	294	571	1102	-	-	-
Stage 1	596	-	-	-	-	-
Stage 2	571	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	294	571	1102	-	-	-
Mov Cap-2 Maneuver	294	-	-	-	-	-
Stage 1	596	-	-	-	-	-
Stage 2	571	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	14.3	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1102	-	388	-	-	
HCM Lane V/C Ratio	-	-	0.006	-	-	
HCM Control Delay (s)	0	-	14.3	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	

HCM 2010 TWSC
7: SC 27 & I-26 WB Ramp




2018 Existing Conditions
AM Peak Hour




Intersection												
Int Delay, s/veh	13.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕			↕			↕	
Traffic Vol, veh/h	0	0	0	158	2	186	87	196	0	0	330	18
Future Vol, veh/h	0	0	0	158	2	186	87	196	0	0	330	18
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	25	25	25	25	25	25	16	16	16	16	16	16
Mvmt Flow	0	0	0	168	2	198	93	209	0	0	351	19
Major/Minor				Minor1		Major1		Major2				
Conflicting Flow All				756	765	209	370	0	-	-	-	0
Stage 1				395	395	-	-	-	-	-	-	-
Stage 2				361	370	-	-	-	-	-	-	-
Critical Hdwy				6.65	6.75	6.45	4.26	-	-	-	-	-
Critical Hdwy Stg 1				5.65	5.75	-	-	-	-	-	-	-
Critical Hdwy Stg 2				5.65	5.75	-	-	-	-	-	-	-
Follow-up Hdwy				3.725	4.225	3.525	2.344	-	-	-	-	-
Pot Cap-1 Maneuver				345	308	777	1115	-	0	0	-	-
Stage 1				633	567	-	-	-	0	0	-	-
Stage 2				657	582	-	-	-	0	0	-	-
Platoon blocked, %								-			-	-
Mov Cap-1 Maneuver				313	0	777	1115	-	-	-	-	-
Mov Cap-2 Maneuver				313	0	-	-	-	-	-	-	-
Stage 1				573	0	-	-	-	-	-	-	-
Stage 2				657	0	-	-	-	-	-	-	-
Approach				WB		NB		SB				
HCM Control Delay, s				37		2.6		0				
HCM LOS				E								
Minor Lane/Major Mvmt		NBL	NBTWBLn1	SBT	SBR							
Capacity (veh/h)		1115	-	462	-	-						
HCM Lane V/C Ratio		0.083	-	0.797	-	-						
HCM Control Delay (s)		8.5	0	37	-	-						
HCM Lane LOS		A	A	E	-	-						
HCM 95th %tile Q(veh)		0.3	-	7.3	-	-						

HCM 2010 TWSC
8: I-26 EB Ramp & SC 27

2018 Existing Conditions
AM Peak Hour

Intersection												
Int Delay, s/veh	4.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕						↗			↖	
Traffic Vol, veh/h	33	0	76	0	0	0	0	250	237	229	259	0
Future Vol, veh/h	33	0	76	0	0	0	0	250	237	229	259	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	23	23	23	23	23	23	16	16	16	16	16	16
Mvmt Flow	36	0	84	0	0	0	0	275	260	252	285	0
Major/Minor	Minor2						Major1			Major2		
Conflicting Flow All	1194	1324	285				-	0	0	535	0	0
Stage 1	789	789	-				-	-	-	-	-	-
Stage 2	405	535	-				-	-	-	-	-	-
Critical Hdwy	6.63	6.73	6.43				-	-	-	4.26	-	-
Critical Hdwy Stg 1	5.63	5.73	-				-	-	-	-	-	-
Critical Hdwy Stg 2	5.63	5.73	-				-	-	-	-	-	-
Follow-up Hdwy	3.707	4.207	3.507				-	-	-	2.344	-	-
Pot Cap-1 Maneuver	187	142	707				0	-	-	966	-	0
Stage 1	413	373	-				0	-	-	-	-	0
Stage 2	630	491	-				0	-	-	-	-	0
Platoon blocked, %								-	-		-	
Mov Cap-1 Maneuver	129	0	707				-	-	-	966	-	-
Mov Cap-2 Maneuver	129	0	-				-	-	-	-	-	-
Stage 1	413	0	-				-	-	-	-	-	-
Stage 2	435	0	-				-	-	-	-	-	-
Approach	EB						NB			SB		
HCM Control Delay, s	24.8						0			4.7		
HCM LOS	C											
Minor Lane/Major Mvmt		NBT	NBR	EBLn1	SBL	SBT						
Capacity (veh/h)		-	-	300	966	-						
HCM Lane V/C Ratio		-	-	0.399	0.261	-						
HCM Control Delay (s)		-	-	24.8	10	0						
HCM Lane LOS		-	-	C	B	A						
HCM 95th %tile Q(veh)		-	-	1.8	1	-						

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	487	334	1
Future Vol, veh/h	0	0	0	487	334	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	16	16	16	16
Mvmt Flow	0	0	0	529	363	1
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	893	364	364	0	-	0
Stage 1	364	-	-	-	-	-
Stage 2	529	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.26	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.344	-	-	-
Pot Cap-1 Maneuver	312	681	1121	-	-	-
Stage 1	703	-	-	-	-	-
Stage 2	591	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	312	681	1121	-	-	-
Mov Cap-2 Maneuver	312	-	-	-	-	-
Stage 1	703	-	-	-	-	-
Stage 2	591	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	0	0		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1121	-	-	-	-	
HCM Lane V/C Ratio	-	-	-	-	-	
HCM Control Delay (s)	0	-	0	-	-	
HCM Lane LOS	A	-	A	-	-	
HCM 95th %tile Q(veh)	0	-	-	-	-	

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	5	482	1	1	333
Future Vol, veh/h	2	5	482	1	1	333
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	16	16	16	16
Mvmt Flow	2	5	530	1	1	366
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	899	531	0	0	531	0
Stage 1	531	-	-	-	-	-
Stage 2	368	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.26	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.344	-
Pot Cap-1 Maneuver	309	548	-	-	969	-
Stage 1	590	-	-	-	-	-
Stage 2	700	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	309	548	-	-	969	-
Mov Cap-2 Maneuver	309	-	-	-	-	-
Stage 1	590	-	-	-	-	-
Stage 2	699	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	13.2	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	449	969	-	
HCM Lane V/C Ratio	-	-	0.017	0.001	-	
HCM Control Delay (s)	-	-	13.2	8.7	0	
HCM Lane LOS	-	-	B	A	A	
HCM 95th %tile Q(veh)	-	-	0.1	0	-	

Intersection												
Int Delay, s/veh	2.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	6	25	31	3	15	8	165	37	13	107	1
Future Vol, veh/h	6	6	25	31	3	15	8	165	37	13	107	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	23	23	23	23	23	23	36	36	36	36	36	36
Mvmt Flow	7	7	28	35	3	17	9	185	42	15	120	1
Major/Minor	Minor2		Minor1			Major1			Major2			
Conflicting Flow All	385	396	121	392	375	206	121	0	0	227	0	0
Stage 1	151	151	-	224	224	-	-	-	-	-	-	-
Stage 2	234	245	-	168	151	-	-	-	-	-	-	-
Critical Hdwy	7.33	6.73	6.43	7.33	6.73	6.43	4.46	-	-	4.46	-	-
Critical Hdwy Stg 1	6.33	5.73	-	6.33	5.73	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.33	5.73	-	6.33	5.73	-	-	-	-	-	-	-
Follow-up Hdwy	3.707	4.207	3.507	3.707	4.207	3.507	2.524	-	-	2.524	-	-
Pot Cap-1 Maneuver	537	510	877	531	524	784	1281	-	-	1165	-	-
Stage 1	804	734	-	733	681	-	-	-	-	-	-	-
Stage 2	724	666	-	787	734	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	514	499	877	500	512	784	1281	-	-	1165	-	-
Mov Cap-2 Maneuver	514	499	-	500	512	-	-	-	-	-	-	-
Stage 1	798	724	-	727	676	-	-	-	-	-	-	-
Stage 2	699	661	-	744	724	-	-	-	-	-	-	-
Approach	EB		WB			NB			SB			
HCM Control Delay, s	10.4		12.1			0.3			0.9			
HCM LOS	B		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1281	-	-	709	563	1165	-	-				
HCM Lane V/C Ratio	0.007	-	-	0.059	0.098	0.013	-	-				
HCM Control Delay (s)	7.8	0	-	10.4	12.1	8.1	0	-				
HCM Lane LOS	A	A	-	B	B	A	A	-				
HCM 95th %tile Q(veh)	0	-	-	0.2	0.3	0	-	-				

HCM 2010 TWSC
12: SC 453 & I-26 WB Ramp

2018 Existing Conditions
AM Peak Hour

Intersection												
Int Delay, s/veh	4.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔			↔			↔	
Traffic Vol, veh/h	0	0	0	57	2	94	26	116	0	0	139	24
Future Vol, veh/h	0	0	0	57	2	94	26	116	0	0	139	24
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	46	46	46	46	46	46	36	36	36	36	36	36
Mvmt Flow	0	0	0	61	2	100	28	123	0	0	148	26

Major/Minor	Minor1		Major1		Major2		
Conflicting Flow All	340	353	123	174	0	-	0
Stage 1	179	179	-	-	-	-	-
Stage 2	161	174	-	-	-	-	-
Critical Hdwy	6.86	6.96	6.66	4.46	-	-	-
Critical Hdwy Stg 1	5.86	5.96	-	-	-	-	-
Critical Hdwy Stg 2	5.86	5.96	-	-	-	-	-
Follow-up Hdwy	3.914	4.414	3.714	2.524	-	-	-
Pot Cap-1 Maneuver	576	508	822	1221	-	0	-
Stage 1	756	675	-	-	-	0	-
Stage 2	771	679	-	-	-	0	-
Platoon blocked, %					-	-	-
Mov Cap-1 Maneuver	562	0	822	1221	-	-	-
Mov Cap-2 Maneuver	562	0	-	-	-	-	-
Stage 1	737	0	-	-	-	-	-
Stage 2	771	0	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.7	1.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBTWBLn1	SBT	SBR
Capacity (veh/h)	1221	-	700	-
HCM Lane V/C Ratio	0.023	-	0.233	-
HCM Control Delay (s)	8	0	11.7	-
HCM Lane LOS	A	A	B	-
HCM 95th %tile Q(veh)	0.1	-	0.9	-

Intersection												
Int Delay, s/veh	2.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Traffic Vol, veh/h	27	2	24	0	0	0	0	115	66	68	128	0
Future Vol, veh/h	27	2	24	0	0	0	0	115	66	68	128	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	53	53	53	53	53	53	36	36	36	36	36	36
Mvmt Flow	30	2	27	0	0	0	0	129	74	76	144	0




Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	462	499	144	-	0	0	203	0	0
Stage 1	296	296	-	-	-	-	-	-	-
Stage 2	166	203	-	-	-	-	-	-	-
Critical Hdwy	6.93	7.03	6.73	-	-	-	4.46	-	-
Critical Hdwy Stg 1	5.93	6.03	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.93	6.03	-	-	-	-	-	-	-
Follow-up Hdwy	3.977	4.477	3.777	-	-	-	2.524	-	-
Pot Cap-1 Maneuver	475	407	785	0	-	-	1190	-	0
Stage 1	652	585	-	0	-	-	-	-	0
Stage 2	754	648	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	442	0	785	-	-	-	1190	-	-
Mov Cap-2 Maneuver	442	0	-	-	-	-	-	-	-
Stage 1	652	0	-	-	-	-	-	-	-
Stage 2	702	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.3	0	2.9
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	SBL	SBT
Capacity (veh/h)	-	-	556	1190	-
HCM Lane V/C Ratio	-	-	0.107	0.064	-
HCM Control Delay (s)	-	-	12.3	8.2	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.4	0.2	-

Intersection

Int Delay, s/veh 5.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	65	80	53	116	107	45
Future Vol, veh/h	65	80	53	116	107	45
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	19	19	36	36	36	36
Mvmt Flow	71	88	58	127	118	49










Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	185	0	0 352 122
Stage 1	-	-	- - 122 -
Stage 2	-	-	- - 230 -
Critical Hdwy	4.29	-	- - 6.76 6.56
Critical Hdwy Stg 1	-	-	- - 5.76 -
Critical Hdwy Stg 2	-	-	- - 5.76 -
Follow-up Hdwy	2.371	-	- - 3.824 3.624
Pot Cap-1 Maneuver	1294	-	- - 583 845
Stage 1	-	-	- - 826 -
Stage 2	-	-	- - 734 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1294	-	- - 549 845
Mov Cap-2 Maneuver	-	-	- - 549 -
Stage 1	-	-	- - 778 -
Stage 2	-	-	- - 734 -

Approach	EB	WB	SB
HCM Control Delay, s	3.6	0	13.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1294	-	-	-	613
HCM Lane V/C Ratio	0.055	-	-	-	0.272
HCM Control Delay (s)	7.9	0	-	-	13.1
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	1.1

HCM 2010 TWSC
1: Jedburg Road & Old Dairy Road

2018 Existing Conditions
PM Peak Hour

Intersection												
Int Delay, s/veh	30.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	64	7	52	10	10	149	27	589	22	96	715	107
Future Vol, veh/h	64	7	52	10	10	149	27	589	22	96	715	107
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Yield	-	-	None	-	-	None
Storage Length	0	-	250	225	-	-	175	-	-	125	-	125
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	9	9	9	9	9	9	7	7	7	7	7	7
Mvmt Flow	70	8	57	11	11	164	30	647	24	105	786	118

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1721	1727	786	1807	1833	659	904	0	0	671	0	0
Stage 1	996	996	-	719	719	-	-	-	-	-	-	-
Stage 2	725	731	-	1088	1114	-	-	-	-	-	-	-
Critical Hdwy	7.19	6.59	6.29	7.19	6.59	6.29	4.17	-	-	4.17	-	-
Critical Hdwy Stg 1	6.19	5.59	-	6.19	5.59	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.19	5.59	-	6.19	5.59	-	-	-	-	-	-	-
Follow-up Hdwy	3.581	4.081	3.381	3.581	4.081	3.381	2.263	-	-	2.263	-	-
Pot Cap-1 Maneuver	~ 68	85	381	59	73	452	732	-	-	896	-	-
Stage 1	286	313	-	409	422	-	-	-	-	-	-	-
Stage 2	406	417	-	253	275	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 33	72	381	41	62	452	732	-	-	896	-	-
Mov Cap-2 Maneuver	~ 33	72	-	41	62	-	-	-	-	-	-	-
Stage 1	274	276	-	392	405	-	-	-	-	-	-	-
Stage 2	242	400	-	185	243	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s\$	417.6	25.8	0.4	1
HCM LOS	F	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	732	-	-	33	252	41	417	896	-	-
HCM Lane V/C Ratio	0.041	-	-	2.131	0.257	0.268	0.419	0.118	-	-
HCM Control Delay (s)	10.1	-	-	\$ 780.2	24.2	122.3	19.7	9.6	-	-
HCM Lane LOS	B	-	-	F	C	F	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	8	1	0.9	2	0.4	-	-

Notes												
-: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined							*: All major volume in platoon			

HCM 2010 Signalized Intersection Summary

2: Jedburg Road & I-26 EB Ramps


















2018 Existing Conditions
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	54	2	91	0	0	0	0	346	456	141	827	0
Future Volume (veh/h)	54	2	91	0	0	0	0	346	456	141	827	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1597	1597				0	1776	1776	1776	1776	0
Adj Flow Rate, veh/h	57	2	96				0	364	480	148	871	0
Adj No. of Lanes	0	1	1				0	1	1	1	1	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	19	19	19				0	7	7	7	7	0
Cap, veh/h	153	5	141				0	999	849	491	1269	0
Arrive On Green	0.10	0.10	0.10				0.00	0.56	0.56	0.06	0.71	0.00
Sat Flow, veh/h	1471	52	1357				0	1776	1509	1691	1776	0
Grp Volume(v), veh/h	59	0	96				0	364	480	148	871	0
Grp Sat Flow(s),veh/h/ln	1523	0	1357				0	1776	1509	1691	1776	0
Q Serve(g_s), s	2.4	0.0	4.5				0.0	7.5	13.5	2.2	18.1	0.0
Cycle Q Clear(g_c), s	2.4	0.0	4.5				0.0	7.5	13.5	2.2	18.1	0.0
Prop In Lane	0.97		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	158	0	141				0	999	849	491	1269	0
V/C Ratio(X)	0.37	0.00	0.68				0.00	0.36	0.57	0.30	0.69	0.00
Avail Cap(c_a), veh/h	369	0	329				0	1263	1073	618	1666	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	27.6	0.0	28.6				0.0	8.0	9.3	5.2	5.3	0.0
Incr Delay (d2), s/veh	1.5	0.0	5.7				0.0	0.2	0.6	0.3	0.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	1.9				0.0	3.7	5.7	1.0	9.0	0.0
LnGrp Delay(d),s/veh	29.1	0.0	34.3				0.0	8.2	9.9	5.6	6.1	0.0
LnGrp LOS	C		C					A	A	A	A	
Approach Vol, veh/h		155						844			1019	
Approach Delay, s/veh		32.3						9.1			6.0	
Approach LOS		C						A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	10.1	43.2		12.8		53.2						
Change Period (Y+Rc), s	6.0	6.0		6.0		6.0						
Max Green Setting (Gmax), s	9.0	47.0		16.0		62.0						
Max Q Clear Time (g_c+I1), s	4.2	15.5		6.5		20.1						
Green Ext Time (p_c), s	0.2	9.6		0.8		27.1						
Intersection Summary												
HCM 2010 Ctrl Delay			9.3									
HCM 2010 LOS			A									

HCM 2010 Signalized Intersection Summary

3: Jedburg Road & I-26 WB Ramps

2018 Existing Conditions
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	583	0	258	78	322	0	0	385	66
Future Volume (veh/h)	0	0	0	583	0	258	78	322	0	0	385	66
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1900	1792	1792	1776	1776	0	0	1776	1900
Adj Flow Rate, veh/h				607	0	269	81	335	0	0	401	69
Adj No. of Lanes				0	1	1	1	1	0	0	1	0
Peak Hour Factor				0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %				6	6	6	7	7	0	0	7	7
Cap, veh/h				706	0	630	223	777	0	0	467	80
Arrive On Green				0.41	0.00	0.41	0.05	0.44	0.00	0.00	0.32	0.32
Sat Flow, veh/h				1707	0	1524	1691	1776	0	0	1477	254
Grp Volume(v), veh/h				607	0	269	81	335	0	0	0	470
Grp Sat Flow(s),veh/h/ln				1707	0	1524	1691	1776	0	0	0	1731
Q Serve(g_s), s				26.2	0.0	10.2	2.5	10.6	0.0	0.0	0.0	20.6
Cycle Q Clear(g_c), s				26.2	0.0	10.2	2.5	10.6	0.0	0.0	0.0	20.6
Prop In Lane				1.00		1.00	1.00		0.00	0.00		0.15
Lane Grp Cap(c), veh/h				706	0	630	223	777	0	0	0	548
V/C Ratio(X)				0.86	0.00	0.43	0.36	0.43	0.00	0.00	0.00	0.86
Avail Cap(c_a), veh/h				739	0	660	331	944	0	0	0	599
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	1.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh				21.6	0.0	16.9	19.4	15.7	0.0	0.0	0.0	25.9
Incr Delay (d2), s/veh				9.7	0.0	0.5	1.0	0.4	0.0	0.0	0.0	11.2
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				14.2	0.0	4.3	1.2	5.2	0.0	0.0	0.0	11.5
LnGrp Delay(d),s/veh				31.3	0.0	17.3	20.4	16.1	0.0	0.0	0.0	37.1
LnGrp LOS				C		B	C	B				D
Approach Vol, veh/h					876			416			470	
Approach Delay, s/veh					27.0			16.9			37.1	
Approach LOS					C			B			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		41.4			9.8	31.6		39.5				
Change Period (Y+Rc), s		6.0			6.0	6.0		6.0				
Max Green Setting (Gmax), s		43.0			9.0	28.0		35.0				
Max Q Clear Time (g_c+I1), s		12.6			4.5	22.6		28.2				
Green Ext Time (p_c), s		7.1			0.1	3.0		5.3				
Intersection Summary												
HCM 2010 Ctrl Delay				27.3								
HCM 2010 LOS				C								

HCM 2010 TWSC
4: Jedburg Road & Drop Off Drive




2018 Existing Conditions
PM Peak Hour




Intersection												
Int Delay, s/veh	5.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕		↕	↕		↕	↕	
Traffic Vol, veh/h	26	7	76	64	7	24	66	472	42	13	311	55
Future Vol, veh/h	26	7	76	64	7	24	66	472	42	13	311	55
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	175	-	-	175	-	-	175	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	8	8	8	8	8	8	7	7	7	7	7	7
Mvmt Flow	28	8	82	69	8	26	71	508	45	14	334	59

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1082	1087	364	1110	1094	531	393	0	0	553	0	0
Stage 1	392	392	-	673	673	-	-	-	-	-	-	-
Stage 2	690	695	-	437	421	-	-	-	-	-	-	-
Critical Hdwy	7.18	6.58	6.28	7.18	6.58	6.28	4.17	-	-	4.17	-	-
Critical Hdwy Stg 1	6.18	5.58	-	6.18	5.58	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.18	5.58	-	6.18	5.58	-	-	-	-	-	-	-
Follow-up Hdwy	3.572	4.072	3.372	3.572	4.072	3.372	2.263	-	-	2.263	-	-
Pot Cap-1 Maneuver	190	211	668	182	209	537	1139	-	-	992	-	-
Stage 1	621	596	-	435	445	-	-	-	-	-	-	-
Stage 2	426	435	-	587	579	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	165	195	668	146	193	537	1139	-	-	992	-	-
Mov Cap-2 Maneuver	165	195	-	146	193	-	-	-	-	-	-	-
Stage 1	582	588	-	408	417	-	-	-	-	-	-	-
Stage 2	373	408	-	501	571	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	20.1		38.6		1		0.3	
HCM LOS	C		E					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1139	-	-	355 146 383	992	-	-
HCM Lane V/C Ratio	0.062	-	-	0.33 0.471 0.087	0.014	-	-
HCM Control Delay (s)	8.4	-	-	20.1 49.9 15.3	8.7	-	-
HCM Lane LOS	A	-	-	C E C	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	1.4 2.2 0.3	0	-	-

Intersection						
Int Delay, s/veh	0.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	6	1	415	4	2	533
Future Vol, veh/h	6	1	415	4	2	533
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	76	76	76	76	76	76
Heavy Vehicles, %	2	2	7	7	7	7
Mvmt Flow	8	1	546	5	3	701
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	1256	549	0	0	551	0
Stage 1	549	-	-	-	-	-
Stage 2	707	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.17	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.263	-
Pot Cap-1 Maneuver	189	535	-	-	994	-
Stage 1	579	-	-	-	-	-
Stage 2	489	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	188	535	-	-	994	-
Mov Cap-2 Maneuver	188	-	-	-	-	-
Stage 1	579	-	-	-	-	-
Stage 2	487	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	23.2	0		0		
HCM LOS	C					
Minor Lane/Major Mvmt		NBT	NBRWBLn1	SBL	SBT	
Capacity (veh/h)		-	-	207	994	-
HCM Lane V/C Ratio		-	-	0.044	0.003	-
HCM Control Delay (s)		-	-	23.2	8.6	0
HCM Lane LOS		-	-	C	A	A
HCM 95th %tile Q(veh)		-	-	0.1	0	-

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	1	0	418	537	2
Future Vol, veh/h	1	1	0	418	537	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	78	78	78	78	78	78
Heavy Vehicles, %	50	50	7	7	7	7
Mvmt Flow	1	1	0	536	688	3
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1226	690	691	0	-	0
Stage 1	690	-	-	-	-	-
Stage 2	536	-	-	-	-	-
Critical Hdwy	6.9	6.7	4.17	-	-	-
Critical Hdwy Stg 1	5.9	-	-	-	-	-
Critical Hdwy Stg 2	5.9	-	-	-	-	-
Follow-up Hdwy	3.95	3.75	2.263	-	-	-
Pot Cap-1 Maneuver	158	373	881	-	-	-
Stage 1	419	-	-	-	-	-
Stage 2	501	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	158	373	881	-	-	-
Mov Cap-2 Maneuver	158	-	-	-	-	-
Stage 1	419	-	-	-	-	-
Stage 2	501	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	21.4	0		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	881	-	222	-	-	
HCM Lane V/C Ratio	-	-	0.012	-	-	
HCM Control Delay (s)	0	-	21.4	-	-	
HCM Lane LOS	A	-	C	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	

HCM 2010 TWSC
7: SC 27 & I-26 WB Ramp

2018 Existing Conditions
PM Peak Hour

Intersection												
Int Delay, s/veh	88.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔			↔			↔	
Traffic Vol, veh/h	0	0	0	201	2	264	83	154	0	0	480	58
Future Vol, veh/h	0	0	0	201	2	264	83	154	0	0	480	58
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	7	7	7	7	7	7	7	7	7	7	7	7
Mvmt Flow	0	0	0	242	2	318	100	186	0	0	578	70

Major/Minor	Minor1		Major1		Major2		
Conflicting Flow All	999	1034	186	648	0	-	0
Stage 1	386	386	-	-	-	-	-
Stage 2	613	648	-	-	-	-	-
Critical Hdwy	6.47	6.57	6.27	4.17	-	-	-
Critical Hdwy Stg 1	5.47	5.57	-	-	-	-	-
Critical Hdwy Stg 2	5.47	5.57	-	-	-	-	-
Follow-up Hdwy	3.563	4.063	3.363	2.263	-	-	-
Pot Cap-1 Maneuver	264	227	843	914	-	0	0
Stage 1	676	602	-	-	-	0	0
Stage 2	531	458	-	-	-	0	0
Platoon blocked, %					-	-	-
Mov Cap-1 Maneuver	~ 232	0	843	914	-	-	-
Mov Cap-2 Maneuver	~ 232	0	-	-	-	-	-
Stage 1	594	0	-	-	-	-	-
Stage 2	531	0	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	233.5	3.3	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBTWBLn1	SBT	SBR
Capacity (veh/h)	914	-	394	-
HCM Lane V/C Ratio	0.109	-	1.428	-
HCM Control Delay (s)	9.4	0	233.5	-
HCM Lane LOS	A	A	F	-
HCM 95th %tile Q(veh)	0.4	-	28.5	-

Notes			
-: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon




HCM 2010 TWSC
8: I-26 EB Ramp & SC 27




2018 Existing Conditions
PM Peak Hour

Intersection												
Int Delay, s/veh	6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↔						↔↕			↕↔	
Traffic Vol, veh/h	21	0	103	0	0	0	0	215	162	315	366	0
Future Vol, veh/h	21	0	103	0	0	0	0	215	162	315	366	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	8	8	8	8	8	8	7	7	7	7	7	7
Mvmt Flow	24	0	120	0	0	0	0	250	188	366	426	0
Major/Minor	Minor2						Major1		Major2			
Conflicting Flow All	1502	1596	426				-	0	0	438	0	0
Stage 1	1158	1158	-				-	-	-	-	-	-
Stage 2	344	438	-				-	-	-	-	-	-
Critical Hdwy	6.48	6.58	6.28				-	-	-	4.17	-	-
Critical Hdwy Stg 1	5.48	5.58	-				-	-	-	-	-	-
Critical Hdwy Stg 2	5.48	5.58	-				-	-	-	-	-	-
Follow-up Hdwy	3.572	4.072	3.372				-	-	-	2.263	-	-
Pot Cap-1 Maneuver	130	103	616				0	-	-	1096	-	0
Stage 1	291	264	-				0	-	-	-	-	0
Stage 2	705	569	-				0	-	-	-	-	0
Platoon blocked, %								-	-	-		
Mov Cap-1 Maneuver	73	0	616				-	-	-	1096	-	-
Mov Cap-2 Maneuver	73	0	-				-	-	-	-	-	-
Stage 1	291	0	-				-	-	-	-	-	-
Stage 2	397	0	-				-	-	-	-	-	-
Approach	EB						NB		SB			
HCM Control Delay, s	32						0		4.6			
HCM LOS	D											
Minor Lane/Major Mvmt		NBT	NBR	EBLn1	SBL	SBT						
Capacity (veh/h)		-	-	273	1096	-						
HCM Lane V/C Ratio		-	-	0.528	0.334	-						
HCM Control Delay (s)		-	-	32	9.9	0						
HCM Lane LOS		-	-	D	A	A						
HCM 95th %tile Q(veh)		-	-	2.9	1.5	-						

HCM 2010 TWSC
9: SC 27 & Interstate Drive

2018 Existing Conditions
PM Peak Hour

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	0	1	376	468	1
Future Vol, veh/h	1	0	1	376	468	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	7	7	7	7
Mvmt Flow	1	0	1	400	498	1
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	901	499	499	0	-	0
Stage 1	499	-	-	-	-	-
Stage 2	402	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.17	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.263	-	-	-
Pot Cap-1 Maneuver	309	572	1040	-	-	-
Stage 1	610	-	-	-	-	-
Stage 2	676	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	309	572	1040	-	-	-
Mov Cap-2 Maneuver	309	-	-	-	-	-
Stage 1	609	-	-	-	-	-
Stage 2	676	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	16.7	0		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1040	-	309	-	-	
HCM Lane V/C Ratio	0.001	-	0.003	-	-	
HCM Control Delay (s)	8.5	0	16.7	-	-	
HCM Lane LOS	A	A	C	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	

Intersection						
Int Delay, s/veh	0.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	4	4	373	7	8	460
Future Vol, veh/h	4	4	373	7	8	460
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	7	7	7	7
Mvmt Flow	4	4	397	7	9	489
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	908	401	0	0	404	0
Stage 1	401	-	-	-	-	-
Stage 2	507	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.17	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.263	-
Pot Cap-1 Maneuver	306	649	-	-	1128	-
Stage 1	676	-	-	-	-	-
Stage 2	605	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	303	649	-	-	1128	-
Mov Cap-2 Maneuver	303	-	-	-	-	-
Stage 1	676	-	-	-	-	-
Stage 2	598	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	13.9	0		0.1		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	413	1128	-	
HCM Lane V/C Ratio	-	-	0.021	0.008	-	
HCM Control Delay (s)	-	-	13.9	8.2	0	
HCM Lane LOS	-	-	B	A	A	
HCM 95th %tile Q(veh)	-	-	0.1	0	-	

Intersection												
Int Delay, s/veh	4.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	2	22	101	9	17	20	125	29	17	142	12
Future Vol, veh/h	6	2	22	101	9	17	20	125	29	17	142	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	8	8	8	8	8	8	24	24	24	24	24	24
Mvmt Flow	7	2	24	111	10	19	22	137	32	19	156	13
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	413	414	163	411	404	153	169	0	0	169	0	0
Stage 1	201	201	-	197	197	-	-	-	-	-	-	-
Stage 2	212	213	-	214	207	-	-	-	-	-	-	-
Critical Hdwy	7.18	6.58	6.28	7.18	6.58	6.28	4.34	-	-	4.34	-	-
Critical Hdwy Stg 1	6.18	5.58	-	6.18	5.58	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.18	5.58	-	6.18	5.58	-	-	-	-	-	-	-
Follow-up Hdwy	3.572	4.072	3.372	3.572	4.072	3.372	2.416	-	-	2.416	-	-
Pot Cap-1 Maneuver	539	520	866	541	526	878	1286	-	-	1286	-	-
Stage 1	787	724	-	791	727	-	-	-	-	-	-	-
Stage 2	777	715	-	775	719	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	506	502	866	510	508	878	1286	-	-	1286	-	-
Mov Cap-2 Maneuver	506	502	-	510	508	-	-	-	-	-	-	-
Stage 1	772	712	-	776	713	-	-	-	-	-	-	-
Stage 2	736	701	-	739	707	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	10.2		14		0.9		0.8					
HCM LOS	B		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1286	-	-	727	540	1286	-	-				
HCM Lane V/C Ratio	0.017	-	-	0.045	0.258	0.015	-	-				
HCM Control Delay (s)	7.8	0	-	10.2	14	7.8	0	-				
HCM Lane LOS	A	A	-	B	B	A	A	-				
HCM 95th %tile Q(veh)	0.1	-	-	0.1	1	0	-	-				

HCM 2010 TWSC
12: SC 453 & I-26 WB Ramp




2018 Existing Conditions
PM Peak Hour

Intersection												
Int Delay, s/veh	4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕			↕			↕	
Traffic Vol, veh/h	0	0	0	76	0	82	27	92	0	0	237	28
Future Vol, veh/h	0	0	0	76	0	82	27	92	0	0	237	28
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	21	21	21	21	21	21	24	24	24	24	24	24
Mvmt Flow	0	0	0	84	0	91	30	102	0	0	263	31
Major/Minor				Minor1		Major1		Major2				
Conflicting Flow All				441	456	102	294	0	-	-	-	0
Stage 1				162	162	-	-	-	-	-	-	-
Stage 2				279	294	-	-	-	-	-	-	-
Critical Hdwy				6.61	6.71	6.41	4.34	-	-	-	-	-
Critical Hdwy Stg 1				5.61	5.71	-	-	-	-	-	-	-
Critical Hdwy Stg 2				5.61	5.71	-	-	-	-	-	-	-
Follow-up Hdwy				3.689	4.189	3.489	2.416	-	-	-	-	-
Pot Cap-1 Maneuver				540	473	904	1152	-	0	0	-	-
Stage 1				823	729	-	-	-	0	0	-	-
Stage 2				726	637	-	-	-	0	0	-	-
Platoon blocked, %								-			-	-
Mov Cap-1 Maneuver				525	0	904	1152	-	-	-	-	-
Mov Cap-2 Maneuver				525	0	-	-	-	-	-	-	-
Stage 1				800	0	-	-	-	-	-	-	-
Stage 2				726	0	-	-	-	-	-	-	-
Approach				WB		NB		SB				
HCM Control Delay, s				12.3		1.9		0				
HCM LOS				B								
Minor Lane/Major Mvmt		NBL	NBTWBLn1	SBT	SBR							
Capacity (veh/h)		1152	-	671	-	-						
HCM Lane V/C Ratio		0.026	-	0.262	-	-						
HCM Control Delay (s)		8.2	0	12.3	-	-						
HCM Lane LOS		A	A	B	-	-						
HCM 95th %tile Q(veh)		0.1	-	1	-	-						

Intersection												
Int Delay, s/veh	2.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Traffic Vol, veh/h	10	0	19	0	0	0	0	109	53	102	211	0
Future Vol, veh/h	10	0	19	0	0	0	0	109	53	102	211	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	52	52	52	52	52	52	24	24	24	24	24	24
Mvmt Flow	11	0	22	0	0	0	0	125	61	117	243	0
Major/Minor	Minor2						Major1			Major2		
Conflicting Flow All	633	663	243				-	0	0	186	0	0
Stage 1	477	477	-				-	-	-	-	-	-
Stage 2	156	186	-				-	-	-	-	-	-
Critical Hdwy	6.92	7.02	6.72				-	-	-	4.34	-	-
Critical Hdwy Stg 1	5.92	6.02	-				-	-	-	-	-	-
Critical Hdwy Stg 2	5.92	6.02	-				-	-	-	-	-	-
Follow-up Hdwy	3.968	4.468	3.768				-	-	-	2.416	-	-
Pot Cap-1 Maneuver	373	324	687				0	-	-	1267	-	0
Stage 1	532	481	-				0	-	-	-	-	0
Stage 2	764	661	-				0	-	-	-	-	0
Platoon blocked, %								-	-	-		
Mov Cap-1 Maneuver	333	0	687				-	-	-	1267	-	-
Mov Cap-2 Maneuver	333	0	-				-	-	-	-	-	-
Stage 1	532	0	-				-	-	-	-	-	-
Stage 2	682	0	-				-	-	-	-	-	-
Approach	EB						NB			SB		
HCM Control Delay, s	12.7						0			2.6		
HCM LOS	B											
Minor Lane/Major Mvmt		NBT	NBR	EBLn1	SBL	SBT						
Capacity (veh/h)		-	-	503	1267	-						
HCM Lane V/C Ratio		-	-	0.066	0.093	-						
HCM Control Delay (s)		-	-	12.7	8.1	0						
HCM Lane LOS		-	-	B	A	A						
HCM 95th %tile Q(veh)		-	-	0.2	0.3	-						

Intersection

Int Delay, s/veh 6.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	34	85	117	128	167	63
Future Vol, veh/h	34	85	117	128	167	63
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	6	6	24	24	24	24
Mvmt Flow	40	101	139	152	199	75

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	291	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.16	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.254	-	-
Pot Cap-1 Maneuver	1248	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1248	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	2.3	0	16
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1248	-	-	-	597
HCM Lane V/C Ratio	0.032	-	-	-	0.459
HCM Control Delay (s)	8	0	-	-	16
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	2.4

I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS










June 2019

D.2 2023 NO BUILD



HCM 2010 TWSC
1: Jedburg Road & Old Dairy Road

2023 No Build Conditions
AM Peak Hour

Intersection												
Int Delay, s/veh	22.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	85	3	37	9	6	88	30	728	19	125	489	94
Future Vol, veh/h	85	3	37	9	6	88	30	728	19	125	489	94
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Yield	-	-	None	-	-	None
Storage Length	0	-	250	150	-	150	150	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	34	34	34	34	34	34	11	11	11	11	11	11
Mvmt Flow	89	3	39	9	6	93	32	766	20	132	515	99

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1279	1679	307	1363	1718	393	614	0	0	786	0	0
Stage 1	829	829	-	840	840	-	-	-	-	-	-	-
Stage 2	450	850	-	523	878	-	-	-	-	-	-	-
Critical Hdwy	8.18	7.18	7.58	8.18	7.18	7.58	4.32	-	-	4.32	-	-
Critical Hdwy Stg 1	7.18	6.18	-	7.18	6.18	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7.18	6.18	-	7.18	6.18	-	-	-	-	-	-	-
Follow-up Hdwy	3.84	4.34	3.64	3.84	4.34	3.64	2.31	-	-	2.31	-	-
Pot Cap-1 Maneuver	94	68	603	80	64	524	903	-	-	773	-	-
Stage 1	270	316	-	266	312	-	-	-	-	-	-	-
Stage 2	481	308	-	431	298	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 60	54	603	61	51	524	903	-	-	773	-	-
Mov Cap-2 Maneuver	~ 60	54	-	61	51	-	-	-	-	-	-	-
Stage 1	261	262	-	257	301	-	-	-	-	-	-	-
Stage 2	374	297	-	330	247	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	280.6		22.9		0.4		1.9	
HCM LOS	F		C					

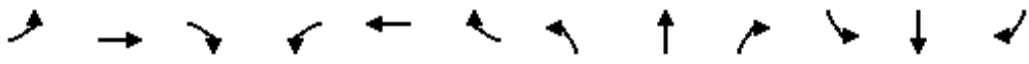






Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	903	-	-	60	342	61	51	524	773	-	-
HCM Lane V/C Ratio	0.035	-	-	1.491	0.123	0.155	0.124	0.177	0.17	-	-
HCM Control Delay (s)	9.1	-	-	\$ 404.6	17	74.6	85.3	13.3	10.6	-	-
HCM Lane LOS	A	-	-	F	C	F	F	B	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	7.9	0.4	0.5	0.4	0.6	0.6	-	-

Notes											
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon					

HCM 2010 Signalized Intersection Summary

2: Jedburg Road & I-26 EB Ramps



















2023 No Build Conditions
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	0	123	0	0	0	0	315	586	278	585	0
Future Volume (veh/h)	22	0	123	0	0	0	0	315	586	278	585	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1473	1473				0	1712	1712	1712	1712	0
Adj Flow Rate, veh/h	23	0	129				0	332	617	293	616	0
Adj No. of Lanes	0	1	1				0	2	1	1	2	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	29	29	29				0	11	11	11	11	0
Cap, veh/h	179	0	160				0	1628	728	527	2275	0
Arrive On Green	0.13	0.00	0.13				0.00	0.50	0.50	0.11	0.70	0.00
Sat Flow, veh/h	1403	0	1252				0	3338	1455	1630	3338	0
Grp Volume(v), veh/h	23	0	129				0	332	617	293	616	0
Grp Sat Flow(s),veh/h/ln	1403	0	1252				0	1626	1455	1630	1626	0
Q Serve(g_s), s	1.0	0.0	7.0				0.0	3.9	25.5	5.4	4.9	0.0
Cycle Q Clear(g_c), s	1.0	0.0	7.0				0.0	3.9	25.5	5.4	4.9	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	179	0	160				0	1628	728	527	2275	0
V/C Ratio(X)	0.13	0.00	0.81				0.00	0.20	0.85	0.56	0.27	0.00
Avail Cap(c_a), veh/h	323	0	289				0	2062	922	626	2905	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	26.9	0.0	29.5				0.0	9.6	15.0	6.0	3.9	0.0
Incr Delay (d2), s/veh	0.3	0.0	9.3				0.0	0.1	6.0	0.9	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	2.8				0.0	1.8	11.3	2.5	2.2	0.0
LnGrp Delay(d),s/veh	27.2	0.0	38.7				0.0	9.7	21.1	6.9	3.9	0.0
LnGrp LOS	C		D					A	C	A	A	
Approach Vol, veh/h		152						949			909	
Approach Delay, s/veh		37.0						17.1			4.9	
Approach LOS		D						B			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	13.8	40.8		14.8		54.6						
Change Period (Y+Rc), s	6.0	6.0		6.0		6.0						
Max Green Setting (Gmax), s	12.0	44.0		16.0		62.0						
Max Q Clear Time (g_c+I1), s	7.4	27.5		9.0		6.9						
Green Ext Time (p_c), s	0.4	7.2		0.4		17.8						
Intersection Summary												
HCM 2010 Ctrl Delay			13.1									
HCM 2010 LOS			B									

HCM 2010 Signalized Intersection Summary











3: Jedburg Road & I-26 WB Ramps




2023 No Build Conditions
AM Peak Hour




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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	0	152	66	271	0	0	547	85
Future Volume (veh/h)	0	0	0	0	0	152	66	271	0	0	547	85
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				0	0	1727	1712	1712	0	0	1712	1712
Adj Flow Rate, veh/h				0	0	160	69	285	0	0	576	0
Adj No. of Lanes				0	0	1	1	2	0	0	2	1
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				0	0	10	11	11	0	0	11	11
Cap, veh/h				0	0	0	685	2660	0	0	1883	842
Arrive On Green				0.00	0.00	0.00	0.06	0.82	0.00	0.00	0.58	0.00
Sat Flow, veh/h					0		1630	3338	0	0	3338	1455
Grp Volume(v), veh/h					0.0		69	285	0	0	576	0
Grp Sat Flow(s),veh/h/ln							1630	1626	0	0	1626	1455
Q Serve(g_s), s							0.4	0.6	0.0	0.0	3.0	0.0
Cycle Q Clear(g_c), s							0.4	0.6	0.0	0.0	3.0	0.0
Prop In Lane							1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h							685	2660	0	0	1883	842
V/C Ratio(X)							0.10	0.11	0.00	0.00	0.31	0.00
Avail Cap(c_a), veh/h							1285	6121	0	0	4146	1855
HCM Platoon Ratio							1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)							1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh							2.0	0.6	0.0	0.0	3.5	0.0
Incr Delay (d2), s/veh							0.1	0.0	0.0	0.0	0.1	0.0
Initial Q Delay(d3),s/veh							0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln							0.2	0.2	0.0	0.0	1.3	0.0
LnGrp Delay(d),s/veh							2.1	0.6	0.0	0.0	3.6	0.0
LnGrp LOS							A	A			A	
Approach Vol, veh/h								354			576	
Approach Delay, s/veh								0.9			3.6	
Approach LOS								A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6						
Phs Duration (G+Y+Rc), s		32.9			7.9	25.1						
Change Period (Y+Rc), s		6.0			6.0	6.0						
Max Green Setting (Gmax), s		62.0			14.0	42.0						
Max Q Clear Time (g_c+I1), s		2.6			2.4	5.0						
Green Ext Time (p_c), s		7.2			0.1	14.1						
Intersection Summary												
HCM 2010 Ctrl Delay				2.6								
HCM 2010 LOS				A								

HCM 2010 TWSC
4: Jedburg Road & Drop Off Drive

2023 No Build Conditions
AM Peak Hour

Intersection												
Int Delay, s/veh	4.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	33	9	94	49	14	14	55	305	63	18	489	55
Future Vol, veh/h	33	9	94	49	14	14	55	305	63	18	489	55
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	175	-	-	200	-	200	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	22	22	22	22	22	22	11	11	11	11	11	11
Mvmt Flow	35	10	100	52	15	15	59	324	67	19	520	59
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	876	1097	290	745	1059	162	579	0	0	391	0	0
Stage 1	588	588	-	442	442	-	-	-	-	-	-	-
Stage 2	288	509	-	303	617	-	-	-	-	-	-	-
Critical Hdwy	7.94	6.94	7.34	7.94	6.94	7.34	4.32	-	-	4.32	-	-
Critical Hdwy Stg 1	6.94	5.94	-	6.94	5.94	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.94	5.94	-	6.94	5.94	-	-	-	-	-	-	-
Follow-up Hdwy	3.72	4.22	3.52	3.72	4.22	3.52	2.31	-	-	2.31	-	-
Pot Cap-1 Maneuver	213	183	650	268	193	795	931	-	-	1102	-	-
Stage 1	416	447	-	514	527	-	-	-	-	-	-	-
Stage 2	642	489	-	628	433	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	184	169	650	204	178	795	931	-	-	1102	-	-
Mov Cap-2 Maneuver	184	169	-	204	178	-	-	-	-	-	-	-
Stage 1	390	439	-	482	494	-	-	-	-	-	-	-
Stage 2	572	458	-	511	426	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	17.4		25		1.2		0.3					
HCM LOS	C		D									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR		
Capacity (veh/h)	931	-	-	184	521	204	291	1102	-	-		
HCM Lane V/C Ratio	0.063	-	-	0.191	0.21	0.256	0.102	0.017	-	-		
HCM Control Delay (s)	9.1	-	-	29.1	13.7	28.6	18.8	8.3	-	-		
HCM Lane LOS	A	-	-	D	B	D	C	A	-	-		
HCM 95th %tile Q(veh)	0.2	-	-	0.7	0.8	1	0.3	0.1	-	-		

Intersection						
Int Delay, s/veh	0					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	0	415	1	0	379
Future Vol, veh/h	2	0	415	1	0	379
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	16	16	16	16
Mvmt Flow	2	0	461	1	0	421
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	883	462	0	0	462	0
Stage 1	462	-	-	-	-	-
Stage 2	421	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.26	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.344	-
Pot Cap-1 Maneuver	316	600	-	-	1029	-
Stage 1	634	-	-	-	-	-
Stage 2	662	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	316	600	-	-	1029	-
Mov Cap-2 Maneuver	316	-	-	-	-	-
Stage 1	634	-	-	-	-	-
Stage 2	662	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	16.5	0		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	316	1029	-	
HCM Lane V/C Ratio	-	-	0.007	-	-	
HCM Control Delay (s)	-	-	16.5	0	-	
HCM Lane LOS	-	-	C	A	-	
HCM 95th %tile Q(veh)	-	-	0	0	-	




Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	1	0	415	378	3
Future Vol, veh/h	1	1	0	415	378	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	50	50	16	16	16	16
Mvmt Flow	1	1	0	456	415	3
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	873	417	418	0	-	0
Stage 1	417	-	-	-	-	-
Stage 2	456	-	-	-	-	-
Critical Hdwy	6.9	6.7	4.26	-	-	-
Critical Hdwy Stg 1	5.9	-	-	-	-	-
Critical Hdwy Stg 2	5.9	-	-	-	-	-
Follow-up Hdwy	3.95	3.75	2.344	-	-	-
Pot Cap-1 Maneuver	266	545	1070	-	-	-
Stage 1	573	-	-	-	-	-
Stage 2	549	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	266	545	1070	-	-	-
Mov Cap-2 Maneuver	266	-	-	-	-	-
Stage 1	573	-	-	-	-	-
Stage 2	549	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	15.1	0		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1070	-	358	-	-	
HCM Lane V/C Ratio	-	-	0.006	-	-	
HCM Control Delay (s)	0	-	15.1	-	-	
HCM Lane LOS	A	-	C	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	




Intersection												
Int Delay, s/veh	22.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔			↑			↓	
Traffic Vol, veh/h	0	0	0	172	2	202	95	213	0	0	359	20
Future Vol, veh/h	0	0	0	172	2	202	95	213	0	0	359	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	25	25	25	25	25	25	16	16	16	16	16	16
Mvmt Flow	0	0	0	183	2	215	101	227	0	0	382	21
Major/Minor				Minor1		Major1		Major2				
Conflicting Flow All				822	832	227	403	0	-	-	-	0
Stage 1				429	429	-	-	-	-	-	-	-
Stage 2				393	403	-	-	-	-	-	-	-
Critical Hdwy				6.65	6.75	6.45	4.26	-	-	-	-	-
Critical Hdwy Stg 1				5.65	5.75	-	-	-	-	-	-	-
Critical Hdwy Stg 2				5.65	5.75	-	-	-	-	-	-	-
Follow-up Hdwy				3.725	4.225	3.525	2.344	-	-	-	-	-
Pot Cap-1 Maneuver				314	280	758	1084	-	0	0	-	-
Stage 1				610	547	-	-	-	0	0	-	-
Stage 2				635	562	-	-	-	0	0	-	-
Platoon blocked, %								-			-	-
Mov Cap-1 Maneuver				280	0	758	1084	-	-	-	-	-
Mov Cap-2 Maneuver				280	0	-	-	-	-	-	-	-
Stage 1				545	0	-	-	-	-	-	-	-
Stage 2				635	0	-	-	-	-	-	-	-
Approach				WB		NB		SB				
HCM Control Delay, s				61.6		2.7		0				
HCM LOS				F								
Minor Lane/Major Mvmt		NBL	NBTWBLn1	SBT	SBR							
Capacity (veh/h)		1084	-	425	-	-						
HCM Lane V/C Ratio		0.093	-	0.941	-	-						
HCM Control Delay (s)		8.7	0	61.6	-	-						
HCM Lane LOS		A	A	F	-	-						
HCM 95th %tile Q(veh)		0.3	-	10.8	-	-						

HCM 2010 TWSC
8: I-26 EB Ramp & SC 27

2023 No Build Conditions
AM Peak Hour

Intersection												
Int Delay, s/veh	5.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↔			↕	
Traffic Vol, veh/h	36	0	83	0	0	0	0	272	258	249	282	0
Future Vol, veh/h	36	0	83	0	0	0	0	272	258	249	282	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	23	23	23	23	23	23	16	16	16	16	16	16
Mvmt Flow	40	0	91	0	0	0	0	299	284	274	310	0
Major/Minor	Minor2			Major1				Major2				
Conflicting Flow All	1299	1441	310				-	0	0	583	0	0
Stage 1	858	858	-				-	-	-	-	-	-
Stage 2	441	583	-				-	-	-	-	-	-
Critical Hdwy	6.63	6.73	6.43				-	-	-	4.26	-	-
Critical Hdwy Stg 1	5.63	5.73	-				-	-	-	-	-	-
Critical Hdwy Stg 2	5.63	5.73	-				-	-	-	-	-	-
Follow-up Hdwy	3.707	4.207	3.507				-	-	-	2.344	-	-
Pot Cap-1 Maneuver	161	120	684				0	-	-	926	-	0
Stage 1	382	346	-				0	-	-	-	-	0
Stage 2	606	467	-				0	-	-	-	-	0
Platoon blocked, %								-	-		-	
Mov Cap-1 Maneuver	104	0	684				-	-	-	926	-	-
Mov Cap-2 Maneuver	104	0	-				-	-	-	-	-	-
Stage 1	382	0	-				-	-	-	-	-	-
Stage 2	390	0	-				-	-	-	-	-	-
Approach	EB			NB				SB				
HCM Control Delay, s	33.1			0				4.9				
HCM LOS	D											
Minor Lane/Major Mvmt	NBT	NBR	EBLn1	SBL	SBT							
Capacity (veh/h)	-	-	255	926	-							
HCM Lane V/C Ratio	-	-	0.513	0.295	-							
HCM Control Delay (s)	-	-	33.1	10.5	0							
HCM Lane LOS	-	-	D	B	A							
HCM 95th %tile Q(veh)	-	-	2.7	1.2	-							




Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	530	364	1
Future Vol, veh/h	0	0	0	530	364	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	16	16	16	16
Mvmt Flow	0	0	0	576	396	1
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	973	397	397	0	-	0
Stage 1	397	-	-	-	-	-
Stage 2	576	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.26	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.344	-	-	-
Pot Cap-1 Maneuver	280	652	1090	-	-	-
Stage 1	679	-	-	-	-	-
Stage 2	562	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	280	652	1090	-	-	-
Mov Cap-2 Maneuver	280	-	-	-	-	-
Stage 1	679	-	-	-	-	-
Stage 2	562	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	0	0		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1090	-	-	-	-	
HCM Lane V/C Ratio	-	-	-	-	-	
HCM Control Delay (s)	0	-	0	-	-	
HCM Lane LOS	A	-	A	-	-	
HCM 95th %tile Q(veh)	0	-	-	-	-	

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	5	525	1	1	362
Future Vol, veh/h	2	5	525	1	1	362
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	16	16	16	16
Mvmt Flow	2	5	577	1	1	398
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	978	578	0	0	578	0
Stage 1	578	-	-	-	-	-
Stage 2	400	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.26	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.344	-
Pot Cap-1 Maneuver	278	516	-	-	930	-
Stage 1	561	-	-	-	-	-
Stage 2	677	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	278	516	-	-	930	-
Mov Cap-2 Maneuver	278	-	-	-	-	-
Stage 1	561	-	-	-	-	-
Stage 2	676	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	13.8	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	415	930	-	
HCM Lane V/C Ratio	-	-	0.019	0.001	-	
HCM Control Delay (s)	-	-	13.8	8.9	0	
HCM Lane LOS	-	-	B	A	A	
HCM 95th %tile Q(veh)	-	-	0.1	0	-	

Intersection												
Int Delay, s/veh	2.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	6	26	33	3	16	8	174	39	14	112	1
Future Vol, veh/h	6	6	26	33	3	16	8	174	39	14	112	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	23	23	23	23	23	23	36	36	36	36	36	36
Mvmt Flow	7	7	29	37	3	18	9	193	43	16	124	1
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	400	411	125	408	390	215	125	0	0	236	0	0
Stage 1	157	157	-	233	233	-	-	-	-	-	-	-
Stage 2	243	254	-	175	157	-	-	-	-	-	-	-
Critical Hdwy	7.33	6.73	6.43	7.33	6.73	6.43	4.46	-	-	4.46	-	-
Critical Hdwy Stg 1	6.33	5.73	-	6.33	5.73	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.33	5.73	-	6.33	5.73	-	-	-	-	-	-	-
Follow-up Hdwy	3.707	4.207	3.507	3.707	4.207	3.507	2.524	-	-	2.524	-	-
Pot Cap-1 Maneuver	525	500	872	518	514	775	1276	-	-	1155	-	-
Stage 1	798	730	-	725	675	-	-	-	-	-	-	-
Stage 2	716	660	-	780	730	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	501	489	872	487	502	775	1276	-	-	1155	-	-
Mov Cap-2 Maneuver	501	489	-	487	502	-	-	-	-	-	-	-
Stage 1	792	719	-	719	670	-	-	-	-	-	-	-
Stage 2	691	655	-	736	719	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	10.4		12.3		0.3		0.9					
HCM LOS	B		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1276	-	-	703	551	1155	-	-				
HCM Lane V/C Ratio	0.007	-	-	0.06	0.105	0.013	-	-				
HCM Control Delay (s)	7.8	0	-	10.4	12.3	8.2	0	-				
HCM Lane LOS	A	A	-	B	B	A	A	-				
HCM 95th %tile Q(veh)	0	-	-	0.2	0.3	0	-	-				

























Intersection												
Int Delay, s/veh	4.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔			↔			↔	
Traffic Vol, veh/h	0	0	0	60	2	99	27	122	0	0	146	25
Future Vol, veh/h	0	0	0	60	2	99	27	122	0	0	146	25
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	46	46	46	46	46	46	36	36	36	36	36	36
Mvmt Flow	0	0	0	64	2	105	29	130	0	0	155	27
Major/Minor				Minor1		Major1		Major2				
Conflicting Flow All				357	370	130	182	0	-	-	-	0
Stage 1				188	188	-	-	-	-	-	-	-
Stage 2				169	182	-	-	-	-	-	-	-
Critical Hdwy				6.86	6.96	6.66	4.46	-	-	-	-	-
Critical Hdwy Stg 1				5.86	5.96	-	-	-	-	-	-	-
Critical Hdwy Stg 2				5.86	5.96	-	-	-	-	-	-	-
Follow-up Hdwy				3.914	4.414	3.714	2.524	-	-	-	-	-
Pot Cap-1 Maneuver				562	496	814	1213	-	0	0	-	-
Stage 1				749	669	-	-	-	0	0	-	-
Stage 2				765	673	-	-	-	0	0	-	-
Platoon blocked, %								-			-	-
Mov Cap-1 Maneuver				547	0	814	1213	-	-	-	-	-
Mov Cap-2 Maneuver				547	0	-	-	-	-	-	-	-
Stage 1				730	0	-	-	-	-	-	-	-
Stage 2				765	0	-	-	-	-	-	-	-
Approach				WB		NB		SB				
HCM Control Delay, s				12		1.5		0				
HCM LOS				B								
Minor Lane/Major Mvmt				NBL	NBTWBLn1	SBT	SBR					
Capacity (veh/h)				1213	-	687	-					
HCM Lane V/C Ratio				0.024	-	0.249	-					
HCM Control Delay (s)				8	0	12	-					
HCM Lane LOS				A	A	B	-					
HCM 95th %tile Q(veh)				0.1	-	1	-					

Intersection												
Int Delay, s/veh	2.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↔						↔↕			↕↔	
Traffic Vol, veh/h	28	2	25	0	0	0	0	121	69	71	135	0
Future Vol, veh/h	28	2	25	0	0	0	0	121	69	71	135	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	53	53	53	53	53	53	36	36	36	36	36	36
Mvmt Flow	31	2	28	0	0	0	0	134	77	79	150	0
Major/Minor	Minor2						Major1			Major2		
Conflicting Flow All	481	519	150				-	0	0	211	0	0
Stage 1	308	308	-				-	-	-	-	-	-
Stage 2	173	211	-				-	-	-	-	-	-
Critical Hdwy	6.93	7.03	6.73				-	-	-	4.46	-	-
Critical Hdwy Stg 1	5.93	6.03	-				-	-	-	-	-	-
Critical Hdwy Stg 2	5.93	6.03	-				-	-	-	-	-	-
Follow-up Hdwy	3.977	4.477	3.777				-	-	-	2.524	-	-
Pot Cap-1 Maneuver	462	396	778				0	-	-	1181	-	0
Stage 1	643	578	-				0	-	-	-	-	0
Stage 2	748	642	-				0	-	-	-	-	0
Platoon blocked, %								-	-		-	
Mov Cap-1 Maneuver	428	0	778				-	-	-	1181	-	-
Mov Cap-2 Maneuver	428	0	-				-	-	-	-	-	-
Stage 1	643	0	-				-	-	-	-	-	-
Stage 2	693	0	-				-	-	-	-	-	-
Approach	EB						NB			SB		
HCM Control Delay, s	12.5						0			2.8		
HCM LOS	B											
Minor Lane/Major Mvmt		NBT	NBR	EBLn1	SBL	SBT						
Capacity (veh/h)		-	-	543	1181	-						
HCM Lane V/C Ratio		-	-	0.113	0.067	-						
HCM Control Delay (s)		-	-	12.5	8.3	0						
HCM Lane LOS		-	-	B	A	A						
HCM 95th %tile Q(veh)		-	-	0.4	0.2	-						

Intersection						
Int Delay, s/veh	5.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	68	84	56	122	112	47
Future Vol, veh/h	68	84	56	122	112	47
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	19	19	36	36	36	36
Mvmt Flow	75	92	62	134	123	52
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	196	0	-	0	371	129
Stage 1	-	-	-	-	129	-
Stage 2	-	-	-	-	242	-
Critical Hdwy	4.29	-	-	-	6.76	6.56
Critical Hdwy Stg 1	-	-	-	-	5.76	-
Critical Hdwy Stg 2	-	-	-	-	5.76	-
Follow-up Hdwy	2.371	-	-	-	3.824	3.624
Pot Cap-1 Maneuver	1281	-	-	-	568	837
Stage 1	-	-	-	-	820	-
Stage 2	-	-	-	-	725	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1281	-	-	-	533	837
Mov Cap-2 Maneuver	-	-	-	-	533	-
Stage 1	-	-	-	-	769	-
Stage 2	-	-	-	-	725	-
Approach	EB	WB		SB		
HCM Control Delay, s	3.6	0		13.5		
HCM LOS				B		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1281	-	-	-	597	
HCM Lane V/C Ratio	0.058	-	-	-	0.293	
HCM Control Delay (s)	8	0	-	-	13.5	
HCM Lane LOS	A	A	-	-	B	
HCM 95th %tile Q(veh)	0.2	-	-	-	1.2	










HCM 2010 Signalized Intersection Summary
15: Volvo Car Drive & Welcome Center/Factory Entrance

2023 No Build Conditions
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	0	11	24	0	11	76	197	219	72	77	26
Future Volume (veh/h)	3	0	11	24	0	11	76	197	219	72	77	26
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727
Adj Flow Rate, veh/h	3	0	12	26	0	12	83	214	238	78	84	28
Adj No. of Lanes	1	1	1	1	1	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	10	10	10	10	10	10	10	10	10	10	10	10
Cap, veh/h	226	45	38	263	83	70	555	458	390	424	454	386
Arrive On Green	0.00	0.00	0.03	0.03	0.00	0.05	0.06	0.27	0.27	0.06	0.26	0.26
Sat Flow, veh/h	1645	1727	1468	1645	1727	1468	1645	1727	1468	1645	1727	1468
Grp Volume(v), veh/h	3	0	12	26	0	12	83	214	238	78	84	28
Grp Sat Flow(s),veh/h/ln	1645	1727	1468	1645	1727	1468	1645	1727	1468	1645	1727	1468
Q Serve(g_s), s	0.1	0.0	0.3	0.6	0.0	0.3	1.4	4.0	5.5	1.3	1.4	0.6
Cycle Q Clear(g_c), s	0.1	0.0	0.3	0.6	0.0	0.3	1.4	4.0	5.5	1.3	1.4	0.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	226	45	38	263	83	70	555	458	390	424	454	386
V/C Ratio(X)	0.01	0.00	0.31	0.10	0.00	0.17	0.15	0.47	0.61	0.18	0.18	0.07
Avail Cap(c_a), veh/h	606	719	611	606	719	611	839	764	649	713	764	649
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.1	0.0	18.4	17.6	0.0	17.6	9.3	11.8	12.4	9.5	11.0	10.6
Incr Delay (d2), s/veh	0.0	0.0	4.6	0.2	0.0	1.1	0.1	0.7	1.6	0.2	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.2	0.3	0.0	0.1	0.6	2.0	2.4	0.6	0.7	0.2
LnGrp Delay(d),s/veh	18.2	0.0	23.0	17.7	0.0	18.7	9.4	12.6	13.9	9.7	11.2	10.7
LnGrp LOS	B		C	B		B	A	B	B	A	B	B
Approach Vol, veh/h	15		38				535				190	
Approach Delay, s/veh	22.0		18.0				12.7				10.5	
Approach LOS	C		B				B				B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.4	16.1	6.1	7.8	8.3	16.2	7.0	7.0				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	9.0	17.0	9.0	16.0	9.0	17.0	9.0	16.0				
Max Q Clear Time (g_c+I1), s	3.4	3.4	2.1	2.3	3.3	7.5	2.6	2.3				
Green Ext Time (p_c), s	0.1	0.9	0.0	0.0	0.1	2.7	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay	12.6											
HCM 2010 LOS	B											

HCM 2010 TWSC
1: Jedburg Road & Old Dairy Road

2023 No Build Conditions
PM Peak Hour

Intersection												
Int Delay, s/veh	29.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	69	8	56	11	11	160	29	633	24	103	769	115
Future Vol, veh/h	69	8	56	11	11	160	29	633	24	103	769	115
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Yield	-	-	None	-	-	None
Storage Length	0	-	250	150	-	150	150	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	9	9	9	9	9	9	7	7	7	7	7	7
Mvmt Flow	76	9	62	12	12	176	32	696	26	113	845	126

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1552	1920	486	1426	1970	361	971	0	0	722	0	0
Stage 1	1134	1134	-	773	773	-	-	-	-	-	-	-
Stage 2	418	786	-	653	1197	-	-	-	-	-	-	-
Critical Hdwy	7.68	6.68	7.08	7.68	6.68	7.08	4.24	-	-	4.24	-	-
Critical Hdwy Stg 1	6.68	5.68	-	6.68	5.68	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.68	5.68	-	6.68	5.68	-	-	-	-	-	-	-
Follow-up Hdwy	3.59	4.09	3.39	3.59	4.09	3.39	2.27	-	-	2.27	-	-
Pot Cap-1 Maneuver	~ 72	61	509	90	57	616	676	-	-	844	-	-
Stage 1	204	262	-	343	391	-	-	-	-	-	-	-
Stage 2	565	385	-	406	244	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 36	50	509	59	47	616	676	-	-	844	-	-
Mov Cap-2 Maneuver	~ 36	50	-	59	47	-	-	-	-	-	-	-
Stage 1	194	227	-	327	373	-	-	-	-	-	-	-
Stage 2	372	367	-	297	211	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s\$	401.7		22.9		0.4		1	
HCM LOS	F		C					


Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	676	-	-	36	237	59	47	616	844	-	-
HCM Lane V/C Ratio	0.047	-	-	2.106	0.297	0.205	0.257	0.285	0.134	-	-
HCM Control Delay (s)	10.6	-	-	\$ 749.8	26.5	81.1	106.3	13.2	9.9	-	-
HCM Lane LOS	B	-	-	F	D	F	F	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	8.4	1.2	0.7	0.9	1.2	0.5	-	-

Notes												
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon						

HCM 2010 Signalized Intersection Summary

2: Jedburg Road & I-26 EB Ramps


















2023 No Build Conditions
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↩	↩					↩↩	↩	↩	↩↩	
Traffic Volume (veh/h)	58	2	98	0	0	0	0	372	490	152	889	0
Future Volume (veh/h)	58	2	98	0	0	0	0	372	490	152	889	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1597	1597				0	1776	1776	1776	1776	0
Adj Flow Rate, veh/h	61	2	103				0	392	516	160	936	0
Adj No. of Lanes	0	1	1				0	2	1	1	2	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	19	19	19				0	7	7	7	7	0
Cap, veh/h	171	6	158				0	1655	740	501	2265	0
Arrive On Green	0.12	0.12	0.12				0.00	0.49	0.49	0.07	0.67	0.00
Sat Flow, veh/h	1475	48	1357				0	3463	1509	1691	3463	0
Grp Volume(v), veh/h	63	0	103				0	392	516	160	936	0
Grp Sat Flow(s),veh/h/ln	1523	0	1357				0	1687	1509	1691	1687	0
Q Serve(g_s), s	2.2	0.0	4.1				0.0	3.8	14.9	2.4	7.1	0.0
Cycle Q Clear(g_c), s	2.2	0.0	4.1				0.0	3.8	14.9	2.4	7.1	0.0
Prop In Lane	0.97		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	177	0	158				0	1655	740	501	2265	0
V/C Ratio(X)	0.36	0.00	0.65				0.00	0.24	0.70	0.32	0.41	0.00
Avail Cap(c_a), veh/h	486	0	433				0	2571	1150	704	3588	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	23.0	0.0	23.9				0.0	8.3	11.1	5.4	4.2	0.0
Incr Delay (d2), s/veh	1.2	0.0	4.5				0.0	0.1	1.2	0.4	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	1.7				0.0	1.8	6.4	1.1	3.3	0.0
LnGrp Delay(d),s/veh	24.2	0.0	28.4				0.0	8.4	12.3	5.7	4.3	0.0
LnGrp LOS	C		C					A	B	A	A	
Approach Vol, veh/h		166						908			1096	
Approach Delay, s/veh		26.8						10.6			4.5	
Approach LOS		C						B			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	10.2	33.7		12.5		43.9						
Change Period (Y+Rc), s	6.0	6.0		6.0		6.0						
Max Green Setting (Gmax), s	11.0	43.0		18.0		60.0						
Max Q Clear Time (g_c+I1), s	4.4	16.9		6.1		9.1						
Green Ext Time (p_c), s	0.2	9.7		1.0		28.8						
Intersection Summary												
HCM 2010 Ctrl Delay			8.8									
HCM 2010 LOS			A									

HCM 2010 Signalized Intersection Summary

3: Jedburg Road & I-26 WB Ramps

2023 No Build Conditions
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	0	277	84	346	0	0	414	71
Future Volume (veh/h)	0	0	0	0	0	277	84	346	0	0	414	71
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				0	0	1792	1776	1776	0	0	1776	1776
Adj Flow Rate, veh/h				0	0	292	88	364	0	0	436	0
Adj No. of Lanes				0	0	1	1	2	0	0	2	1
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				0	0	6	7	7	0	0	7	7
Cap, veh/h				0	0	0	757	2627	0	0	1638	733
Arrive On Green				0.00	0.00	0.00	0.07	0.78	0.00	0.00	0.49	0.00
Sat Flow, veh/h					0		1691	3463	0	0	3463	1509
Grp Volume(v), veh/h					0.0		88	364	0	0	436	0
Grp Sat Flow(s),veh/h/ln							1691	1687	0	0	1687	1509
Q Serve(g_s), s							0.5	0.7	0.0	0.0	2.1	0.0
Cycle Q Clear(g_c), s							0.5	0.7	0.0	0.0	2.1	0.0
Prop In Lane							1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h							757	2627	0	0	1638	733
V/C Ratio(X)							0.12	0.14	0.00	0.00	0.27	0.00
Avail Cap(c_a), veh/h							1447	6352	0	0	3985	1783
HCM Platoon Ratio							1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)							1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh							2.3	0.7	0.0	0.0	4.1	0.0
Incr Delay (d2), s/veh							0.1	0.0	0.0	0.0	0.1	0.0
Initial Q Delay(d3),s/veh							0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln							0.2	0.3	0.0	0.0	0.9	0.0
LnGrp Delay(d),s/veh							2.4	0.8	0.0	0.0	4.2	0.0
LnGrp LOS							A	A			A	
Approach Vol, veh/h								452			436	
Approach Delay, s/veh								1.1			4.2	
Approach LOS								A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6						
Phs Duration (G+Y+Rc), s		27.1			7.9	19.2						
Change Period (Y+Rc), s		6.0			6.0	6.0						
Max Green Setting (Gmax), s		51.0			13.0	32.0						
Max Q Clear Time (g_c+I1), s		2.7			2.5	4.1						
Green Ext Time (p_c), s		9.1			0.1	9.1						
Intersection Summary												
HCM 2010 Ctrl Delay				2.6								
HCM 2010 LOS				A								

HCM 2010 TWSC
4: Jedburg Road & Drop Off Drive




2023 No Build Conditions
PM Peak Hour




Intersection												
Int Delay, s/veh	4.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↰↱		↰	↰		↰	↰↱	↰	↰	↰↱	
Traffic Vol, veh/h	28	8	82	69	8	26	71	507	45	14	334	59
Future Vol, veh/h	28	8	82	69	8	26	71	507	45	14	334	59
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	175	-	-	200	-	200	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	8	8	8	8	8	8	7	7	7	7	7	7
Mvmt Flow	30	9	88	74	9	28	76	545	48	15	359	63

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	850	1166	211	911	1149	273	422	0	0	593	0	0
Stage 1	421	421	-	697	697	-	-	-	-	-	-	-
Stage 2	429	745	-	214	452	-	-	-	-	-	-	-
Critical Hdwy	7.66	6.66	7.06	7.66	6.66	7.06	4.24	-	-	4.24	-	-
Critical Hdwy Stg 1	6.66	5.66	-	6.66	5.66	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.66	5.66	-	6.66	5.66	-	-	-	-	-	-	-
Follow-up Hdwy	3.58	4.08	3.38	3.58	4.08	3.38	2.27	-	-	2.27	-	-
Pot Cap-1 Maneuver	244	184	776	220	188	707	1099	-	-	945	-	-
Stage 1	565	572	-	384	427	-	-	-	-	-	-	-
Stage 2	559	405	-	751	554	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	211	169	776	176	172	707	1099	-	-	945	-	-
Mov Cap-2 Maneuver	211	169	-	176	172	-	-	-	-	-	-	-
Stage 1	526	563	-	358	398	-	-	-	-	-	-	-
Stage 2	489	377	-	645	545	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	15.1		31.4		1		0.3	
HCM LOS	C		D					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1099	-	-	211	169	665	176	408	945	-	-
HCM Lane V/C Ratio	0.069	-	-	0.143	0.025	0.139	0.422	0.09	0.016	-	-
HCM Control Delay (s)	8.5	-	-	24.9	26.9	11.3	39.6	14.7	8.9	-	-
HCM Lane LOS	A	-	-	C	D	B	E	B	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.5	0.1	0.5	1.9	0.3	0	-	-

Intersection						
Int Delay, s/veh	0.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	7	1	451	4	2	579
Future Vol, veh/h	7	1	451	4	2	579
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	7	7	7	7
Mvmt Flow	8	1	501	4	2	643
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	1150	503	0	0	505	0
Stage 1	503	-	-	-	-	-
Stage 2	647	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.17	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.263	-
Pot Cap-1 Maneuver	219	569	-	-	1034	-
Stage 1	607	-	-	-	-	-
Stage 2	521	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	218	569	-	-	1034	-
Mov Cap-2 Maneuver	218	-	-	-	-	-
Stage 1	607	-	-	-	-	-
Stage 2	519	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	20.9	0		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	236	1034	-	
HCM Lane V/C Ratio	-	-	0.038	0.002	-	
HCM Control Delay (s)	-	-	20.9	8.5	0	
HCM Lane LOS	-	-	C	A	A	
HCM 95th %tile Q(veh)	-	-	0.1	0	-	

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	1	0	454	584	2
Future Vol, veh/h	1	1	0	454	584	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	50	50	7	7	7	7
Mvmt Flow	1	1	0	504	649	2
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1154	650	651	0	-	0
Stage 1	650	-	-	-	-	-
Stage 2	504	-	-	-	-	-
Critical Hdwy	6.9	6.7	4.17	-	-	-
Critical Hdwy Stg 1	5.9	-	-	-	-	-
Critical Hdwy Stg 2	5.9	-	-	-	-	-
Follow-up Hdwy	3.95	3.75	2.263	-	-	-
Pot Cap-1 Maneuver	176	394	912	-	-	-
Stage 1	439	-	-	-	-	-
Stage 2	519	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	176	394	912	-	-	-
Mov Cap-2 Maneuver	176	-	-	-	-	-
Stage 1	439	-	-	-	-	-
Stage 2	519	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	20	0		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	912	-	243	-	-	
HCM Lane V/C Ratio	-	-	0.009	-	-	
HCM Control Delay (s)	0	-	20	-	-	
HCM Lane LOS	A	-	C	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	

Intersection												
Int Delay, s/veh	89.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔			↔			↔	
Traffic Vol, veh/h	0	0	0	219	2	287	90	167	0	0	522	63
Future Vol, veh/h	0	0	0	219	2	287	90	167	0	0	522	63
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	7	7	7	7	7	7	7	7	7	7	7	7
Mvmt Flow	0	0	0	243	2	319	100	186	0	0	580	70

Major/Minor	Minor1		Major1		Major2		
Conflicting Flow All	1001	1036	186	650	0	-	0
Stage 1	386	386	-	-	-	-	-
Stage 2	615	650	-	-	-	-	-
Critical Hdwy	6.47	6.57	6.27	4.17	-	-	-
Critical Hdwy Stg 1	5.47	5.57	-	-	-	-	-
Critical Hdwy Stg 2	5.47	5.57	-	-	-	-	-
Follow-up Hdwy	3.563	4.063	3.363	2.263	-	-	-
Pot Cap-1 Maneuver	263	227	843	913	-	0	-
Stage 1	676	602	-	-	-	0	-
Stage 2	530	457	-	-	-	0	-
Platoon blocked, %					-		-
Mov Cap-1 Maneuver	~ 231	0	843	913	-	-	-
Mov Cap-2 Maneuver	~ 231	0	-	-	-	-	-
Stage 1	594	0	-	-	-	-	-
Stage 2	530	0	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	237	3.3	0
HCM LOS	F		




Minor Lane/Major Mvmt	NBL	NBTWBLn1	SBT	SBR
Capacity (veh/h)	913	-	393	-
HCM Lane V/C Ratio	0.11	-	1.436	-
HCM Control Delay (s)	9.4	0	237	-
HCM Lane LOS	A	A	F	-
HCM 95th %tile Q(veh)	0.4	-	28.8	-




Notes			
-: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

HCM 2010 TWSC
8: I-26 EB Ramp & SC 27




2023 No Build Conditions
PM Peak Hour

Intersection												
Int Delay, s/veh	6.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕						↕			↕	
Traffic Vol, veh/h	23	0	112	0	0	0	0	234	176	343	398	0
Future Vol, veh/h	23	0	112	0	0	0	0	234	176	343	398	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	8	8	8	8	8	8	7	7	7	7	7	7
Mvmt Flow	26	0	124	0	0	0	0	260	196	381	442	0
Major/Minor	Minor2						Major1		Major2			
Conflicting Flow All	1562	1660	442				-	0	0	456	0	0
Stage 1	1204	1204	-				-	-	-	-	-	-
Stage 2	358	456	-				-	-	-	-	-	-
Critical Hdwy	6.48	6.58	6.28				-	-	-	4.17	-	-
Critical Hdwy Stg 1	5.48	5.58	-				-	-	-	-	-	-
Critical Hdwy Stg 2	5.48	5.58	-				-	-	-	-	-	-
Follow-up Hdwy	3.572	4.072	3.372				-	-	-	2.263	-	-
Pot Cap-1 Maneuver	119	94	603				0	-	-	1079	-	0
Stage 1	276	250	-				0	-	-	-	-	0
Stage 2	694	558	-				0	-	-	-	-	0
Platoon blocked, %								-	-	-		
Mov Cap-1 Maneuver	63	0	603				-	-	-	1079	-	-
Mov Cap-2 Maneuver	63	0	-				-	-	-	-	-	-
Stage 1	276	0	-				-	-	-	-	-	-
Stage 2	369	0	-				-	-	-	-	-	-
Approach	EB						NB		SB			
HCM Control Delay, s	40.4						0		4.7			
HCM LOS	E											
Minor Lane/Major Mvmt		NBT	NBR	EBLn1	SBL	SBT						
Capacity (veh/h)		-	-	245	1079	-						
HCM Lane V/C Ratio		-	-	0.612	0.353	-						
HCM Control Delay (s)		-	-	40.4	10.1	0						
HCM Lane LOS		-	-	E	B	A						
HCM 95th %tile Q(veh)		-	-	3.6	1.6	-						




Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	0	1	409	509	1
Future Vol, veh/h	1	0	1	409	509	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	7	7	7	7
Mvmt Flow	1	0	1	435	541	1
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	979	542	542	0	-	0
Stage 1	542	-	-	-	-	-
Stage 2	437	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.17	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.263	-	-	-
Pot Cap-1 Maneuver	277	540	1002	-	-	-
Stage 1	583	-	-	-	-	-
Stage 2	651	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	277	540	1002	-	-	-
Mov Cap-2 Maneuver	277	-	-	-	-	-
Stage 1	582	-	-	-	-	-
Stage 2	651	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	18	0		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1002	-	277	-	-	
HCM Lane V/C Ratio	0.001	-	0.004	-	-	
HCM Control Delay (s)	8.6	0	18	-	-	
HCM Lane LOS	A	A	C	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	

Intersection						
Int Delay, s/veh	0.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	4	4	406	8	9	500
Future Vol, veh/h	4	4	406	8	9	500
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	7	7	7	7
Mvmt Flow	4	4	432	9	10	532
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	989	437	0	0	441	0
Stage 1	437	-	-	-	-	-
Stage 2	552	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.17	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.263	-
Pot Cap-1 Maneuver	274	620	-	-	1093	-
Stage 1	651	-	-	-	-	-
Stage 2	577	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	270	620	-	-	1093	-
Mov Cap-2 Maneuver	270	-	-	-	-	-
Stage 1	651	-	-	-	-	-
Stage 2	569	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	14.8	0		0.1		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	-		376	1093	
HCM Lane V/C Ratio	-	-		0.023	0.009	
HCM Control Delay (s)	-	-		14.8	8.3	
HCM Lane LOS	-	-		B	A	
HCM 95th %tile Q(veh)	-	-		0.1	0	

Intersection												
Int Delay, s/veh	4.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	2	23	106	9	18	21	132	30	18	149	13
Future Vol, veh/h	6	2	23	106	9	18	21	132	30	18	149	13
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	8	8	8	8	8	8	24	24	24	24	24	24
Mvmt Flow	7	2	25	116	10	20	23	145	33	20	164	14
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	434	435	171	433	426	162	178	0	0	178	0	0
Stage 1	211	211	-	208	208	-	-	-	-	-	-	-
Stage 2	223	224	-	225	218	-	-	-	-	-	-	-
Critical Hdwy	7.18	6.58	6.28	7.18	6.58	6.28	4.34	-	-	4.34	-	-
Critical Hdwy Stg 1	6.18	5.58	-	6.18	5.58	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.18	5.58	-	6.18	5.58	-	-	-	-	-	-	-
Follow-up Hdwy	3.572	4.072	3.372	3.572	4.072	3.372	2.416	-	-	2.416	-	-
Pot Cap-1 Maneuver	522	505	857	523	511	867	1276	-	-	1276	-	-
Stage 1	778	717	-	780	719	-	-	-	-	-	-	-
Stage 2	766	707	-	764	712	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	488	486	857	492	492	867	1276	-	-	1276	-	-
Mov Cap-2 Maneuver	488	486	-	492	492	-	-	-	-	-	-	-
Stage 1	762	705	-	764	705	-	-	-	-	-	-	-
Stage 2	723	693	-	727	700	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	10.3		14.5		0.9		0.8					
HCM LOS	B		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1276	-	-	717	523	1276	-	-				
HCM Lane V/C Ratio	0.018	-	-	0.048	0.279	0.016	-	-				
HCM Control Delay (s)	7.9	0	-	10.3	14.5	7.9	0	-				
HCM Lane LOS	A	A	-	B	B	A	A	-				
HCM 95th %tile Q(veh)	0.1	-	-	0.1	1.1	0	-	-				

























Intersection												
Int Delay, s/veh	4.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	80	0	86	28	97	0	0	249	29
Future Vol, veh/h	0	0	0	80	0	86	28	97	0	0	249	29
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	21	21	21	21	21	21	24	24	24	24	24	24
Mvmt Flow	0	0	0	89	0	96	31	108	0	0	277	32
Major/Minor				Minor1		Major1		Major2				
Conflicting Flow All				463	479	108	309	0	-	-	-	0
Stage 1				170	170	-	-	-	-	-	-	-
Stage 2				293	309	-	-	-	-	-	-	-
Critical Hdwy				6.61	6.71	6.41	4.34	-	-	-	-	-
Critical Hdwy Stg 1				5.61	5.71	-	-	-	-	-	-	-
Critical Hdwy Stg 2				5.61	5.71	-	-	-	-	-	-	-
Follow-up Hdwy				3.689	4.189	3.489	2.416	-	-	-	-	-
Pot Cap-1 Maneuver				524	459	897	1137	-	0	0	-	-
Stage 1				816	723	-	-	-	0	0	-	-
Stage 2				716	627	-	-	-	0	0	-	-
Platoon blocked, %								-			-	-
Mov Cap-1 Maneuver				509	0	897	1137	-	-	-	-	-
Mov Cap-2 Maneuver				509	0	-	-	-	-	-	-	-
Stage 1				792	0	-	-	-	-	-	-	-
Stage 2				716	0	-	-	-	-	-	-	-
Approach				WB		NB		SB				
HCM Control Delay, s				12.6		1.8		0				
HCM LOS				B								
Minor Lane/Major Mvmt	NBL	NBT	WBLn1	SBT	SBR							
Capacity (veh/h)	1137	-	656	-	-							
HCM Lane V/C Ratio	0.027	-	0.281	-	-							
HCM Control Delay (s)	8.3	0	12.6	-	-							
HCM Lane LOS	A	A	B	-	-							
HCM 95th %tile Q(veh)	0.1	-	1.2	-	-							

Intersection												
Int Delay, s/veh	2.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↔						↔↕			↕↔	
Traffic Vol, veh/h	11	0	20	0	0	0	0	114	56	107	222	0
Future Vol, veh/h	11	0	20	0	0	0	0	114	56	107	222	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	52	52	52	52	52	52	24	24	24	24	24	24
Mvmt Flow	12	0	22	0	0	0	0	127	62	119	247	0
Major/Minor	Minor2						Major1			Major2		
Conflicting Flow All	643	674	247				-	0	0	189	0	0
Stage 1	485	485	-				-	-	-	-	-	-
Stage 2	158	189	-				-	-	-	-	-	-
Critical Hdwy	6.92	7.02	6.72				-	-	-	4.34	-	-
Critical Hdwy Stg 1	5.92	6.02	-				-	-	-	-	-	-
Critical Hdwy Stg 2	5.92	6.02	-				-	-	-	-	-	-
Follow-up Hdwy	3.968	4.468	3.768				-	-	-	2.416	-	-
Pot Cap-1 Maneuver	368	319	684				0	-	-	1263	-	0
Stage 1	528	477	-				0	-	-	-	-	0
Stage 2	762	659	-				0	-	-	-	-	0
Platoon blocked, %							-	-				
Mov Cap-1 Maneuver	328	0	684				-	-	-	1263	-	-
Mov Cap-2 Maneuver	328	0	-				-	-	-	-	-	-
Stage 1	528	0	-				-	-	-	-	-	-
Stage 2	679	0	-				-	-	-	-	-	-
Approach	EB						NB			SB		
HCM Control Delay, s	12.8						0			2.6		
HCM LOS	B											
Minor Lane/Major Mvmt		NBT	NBR	EBLn1	SBL	SBT						
Capacity (veh/h)		-	-	494	1263	-						
HCM Lane V/C Ratio		-	-	0.07	0.094	-						
HCM Control Delay (s)		-	-	12.8	8.1	0						
HCM Lane LOS		-	-	B	A	A						
HCM 95th %tile Q(veh)		-	-	0.2	0.3	-						

Intersection						
Int Delay, s/veh	6.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	36	89	123	134	176	67
Future Vol, veh/h	36	89	123	134	176	67
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	6	6	24	24	24	24
Mvmt Flow	40	99	137	149	196	74
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	286	0	-	0	391	212
Stage 1	-	-	-	-	212	-
Stage 2	-	-	-	-	179	-
Critical Hdwy	4.16	-	-	-	6.64	6.44
Critical Hdwy Stg 1	-	-	-	-	5.64	-
Critical Hdwy Stg 2	-	-	-	-	5.64	-
Follow-up Hdwy	2.254	-	-	-	3.716	3.516
Pot Cap-1 Maneuver	1253	-	-	-	572	776
Stage 1	-	-	-	-	774	-
Stage 2	-	-	-	-	802	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1253	-	-	-	553	776
Mov Cap-2 Maneuver	-	-	-	-	553	-
Stage 1	-	-	-	-	748	-
Stage 2	-	-	-	-	802	-
Approach	EB	WB		SB		
HCM Control Delay, s	2.3	0		15.8		
HCM LOS				C		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1253	-	-	-	601	
HCM Lane V/C Ratio	0.032	-	-	-	0.449	
HCM Control Delay (s)	8	0	-	-	15.8	
HCM Lane LOS	A	A	-	-	C	
HCM 95th %tile Q(veh)	0.1	-	-	-	2.3	

HCM 2010 Signalized Intersection Summary
15: Volvo Car Drive & Welcome Center/Factory Entrance

2023 No Build Conditions
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	0	79	219	0	72	18	112	25	8	174	5
Future Volume (veh/h)	27	0	79	219	0	72	18	112	25	8	174	5
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727
Adj Flow Rate, veh/h	29	0	86	238	0	78	20	122	27	9	189	5
Adj No. of Lanes	1	1	1	1	1	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	10	10	10	10	10	10	10	10	10	10	10	10
Cap, veh/h	323	164	140	540	393	334	288	338	287	331	320	272
Arrive On Green	0.03	0.00	0.10	0.16	0.00	0.23	0.02	0.20	0.20	0.01	0.19	0.19
Sat Flow, veh/h	1645	1727	1468	1645	1727	1468	1645	1727	1468	1645	1727	1468
Grp Volume(v), veh/h	29	0	86	238	0	78	20	122	27	9	189	5
Grp Sat Flow(s),veh/h/ln	1645	1727	1468	1645	1727	1468	1645	1727	1468	1645	1727	1468
Q Serve(g_s), s	0.7	0.0	2.5	5.3	0.0	1.9	0.4	2.7	0.7	0.2	4.4	0.1
Cycle Q Clear(g_c), s	0.7	0.0	2.5	5.3	0.0	1.9	0.4	2.7	0.7	0.2	4.4	0.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	323	164	140	540	393	334	288	338	287	331	320	272
V/C Ratio(X)	0.09	0.00	0.62	0.44	0.00	0.23	0.07	0.36	0.09	0.03	0.59	0.02
Avail Cap(c_a), veh/h	612	622	529	648	661	562	589	622	529	649	622	529
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.4	0.0	19.3	12.9	0.0	14.0	14.4	15.5	14.6	14.5	16.6	14.8
Incr Delay (d2), s/veh	0.1	0.0	4.3	0.6	0.0	0.4	0.1	0.7	0.1	0.0	1.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	1.2	2.4	0.0	0.8	0.2	1.3	0.3	0.1	2.3	0.1
LnGrp Delay(d),s/veh	17.5	0.0	23.7	13.4	0.0	14.3	14.5	16.1	14.8	14.6	18.3	14.8
LnGrp LOS	B		C	B		B	B	B	B	B	B	B
Approach Vol, veh/h		115			316			169			203	
Approach Delay, s/veh		22.1			13.7			15.7			18.0	
Approach LOS		C			B			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.9	14.2	7.2	16.1	6.4	14.7	13.1	10.2				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	9.0	16.0	9.0	17.0	9.0	16.0	10.0	16.0				
Max Q Clear Time (g_c+I1), s	2.4	6.4	2.7	3.9	2.2	4.7	7.3	4.5				
Green Ext Time (p_c), s	0.0	1.8	0.0	0.1	0.0	1.2	0.2	0.2				
Intersection Summary												
HCM 2010 Ctrl Delay			16.4									
HCM 2010 LOS			B									

I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS










June 2019

D.3 2043 NO BUILD



HCM 2010 TWSC
1: Jedburg Road & Old Dairy Road

2043 No Build Conditions
AM Peak Hour

Intersection												
Int Delay, s/veh	137.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	109	4	47	11	8	113	39	930	25	160	625	120
Future Vol, veh/h	109	4	47	11	8	113	39	930	25	160	625	120
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Yield	-	-	None	-	-	None
Storage Length	0	-	250	150	-	150	150	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	34	34	34	34	34	34	11	11	11	11	11	11
Mvmt Flow	115	4	49	12	8	119	41	979	26	168	658	126

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1633	2144	392	1741	2194	503	784	0	0	1005	0	0
Stage 1	1057	1057	-	1074	1074	-	-	-	-	-	-	-
Stage 2	576	1087	-	667	1120	-	-	-	-	-	-	-
Critical Hdwy	8.18	7.18	7.58	8.18	7.18	7.58	4.32	-	-	4.32	-	-
Critical Hdwy Stg 1	7.18	6.18	-	7.18	6.18	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7.18	6.18	-	7.18	6.18	-	-	-	-	-	-	-
Follow-up Hdwy	3.84	4.34	3.64	3.84	4.34	3.64	2.31	-	-	2.31	-	-
Pot Cap-1 Maneuver	~ 48	32	525	39	30	438	774	-	-	633	-	-
Stage 1	190	239	-	185	234	-	-	-	-	-	-	-
Stage 2	398	230	-	346	221	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 19	22	525	23	21	438	774	-	-	633	-	-
Mov Cap-2 Maneuver	~ 19	22	-	23	21	-	-	-	-	-	-	-
Stage 1	180	176	-	175	222	-	-	-	-	-	-	-
Stage 2	264	218	-	225	162	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, \$ 1828.9		52.3	0.4	2.3
HCM LOS	F	F		




















Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	774	-	-	19	188	23	21	438	633	-	-
HCM Lane V/C Ratio	0.053	-	-	6.039	0.286	0.503	0.401	0.272	0.266	-	-
HCM Control Delay (s)	9.9	-	-	\$ 2669.9	31.6	268.8	263.2	16.3	12.7	-	-
HCM Lane LOS	A	-	-	F	D	F	F	C	B	-	-
HCM 95th %tile Q(veh)	0.2	-	-	14.9	1.1	1.5	1.2	1.1	1.1	-	-

Notes											
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined				*: All major volume in platoon			

HCM 2010 Signalized Intersection Summary

2: Jedburg Road & I-26 EB Ramps


















2043 No Build Conditions
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	28	0	157	0	0	0	0	403	749	356	748	0
Future Volume (veh/h)	28	0	157	0	0	0	0	403	749	356	748	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1473	1473				0	1712	1712	1712	1712	0
Adj Flow Rate, veh/h	29	0	165				0	424	788	375	787	0
Adj No. of Lanes	0	1	1				0	2	1	1	2	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	29	29	29				0	11	11	11	11	0
Cap, veh/h	216	0	193				0	1626	727	480	2287	0
Arrive On Green	0.15	0.00	0.15				0.00	0.50	0.50	0.13	0.70	0.00
Sat Flow, veh/h	1403	0	1252				0	3338	1455	1630	3338	0
Grp Volume(v), veh/h	29	0	165				0	424	788	375	787	0
Grp Sat Flow(s),veh/h/ln	1403	0	1252				0	1626	1455	1630	1626	0
Q Serve(g_s), s	1.5	0.0	10.8				0.0	6.3	42.0	8.6	8.0	0.0
Cycle Q Clear(g_c), s	1.5	0.0	10.8				0.0	6.3	42.0	8.6	8.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	216	0	193				0	1626	727	480	2287	0
V/C Ratio(X)	0.13	0.00	0.86				0.00	0.26	1.08	0.78	0.34	0.00
Avail Cap(c_a), veh/h	267	0	238				0	1626	727	537	2400	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	30.7	0.0	34.6				0.0	12.1	21.0	9.5	4.9	0.0
Incr Delay (d2), s/veh	0.3	0.0	21.6				0.0	0.1	58.2	6.6	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	4.9				0.0	2.8	28.5	5.5	3.5	0.0
LnGrp Delay(d),s/veh	31.0	0.0	56.2				0.0	12.2	79.2	16.1	5.0	0.0
LnGrp LOS	C		E					B	F	B	A	
Approach Vol, veh/h		194						1212			1162	
Approach Delay, s/veh		52.4						55.8			8.6	
Approach LOS		D						E			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	17.1	48.0		18.9		65.1						
Change Period (Y+Rc), s	6.0	6.0		6.0		6.0						
Max Green Setting (Gmax), s	14.0	42.0		16.0		62.0						
Max Q Clear Time (g_c+I1), s	10.6	44.0		12.8		10.0						
Green Ext Time (p_c), s	0.4	0.0		0.3		23.7						
Intersection Summary												
HCM 2010 Ctrl Delay			34.1									
HCM 2010 LOS			C									

HCM 2010 Signalized Intersection Summary










3: Jedburg Road & I-26 WB Ramps




2043 No Build Conditions
AM Peak Hour




												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	0	194	84	347	0	0	700	109
Future Volume (veh/h)	0	0	0	0	0	194	84	347	0	0	700	109
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				0	0	1727	1712	1712	0	0	1712	1712
Adj Flow Rate, veh/h				0	0	204	88	365	0	0	737	0
Adj No. of Lanes				0	0	1	1	2	0	0	2	1
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				0	0	10	11	11	0	0	11	11
Cap, veh/h				0	0	0	631	2749	0	0	2040	913
Arrive On Green				0.00	0.00	0.00	0.06	0.85	0.00	0.00	0.63	0.00
Sat Flow, veh/h					0		1630	3338	0	0	3338	1455
Grp Volume(v), veh/h					0.0		88	365	0	0	737	0
Grp Sat Flow(s),veh/h/ln							1630	1626	0	0	1626	1455
Q Serve(g_s), s							0.6	0.8	0.0	0.0	4.2	0.0
Cycle Q Clear(g_c), s							0.6	0.8	0.0	0.0	4.2	0.0
Prop In Lane							1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h							631	2749	0	0	2040	913
V/C Ratio(X)							0.14	0.13	0.00	0.00	0.36	0.00
Avail Cap(c_a), veh/h							1074	5116	0	0	3522	1576
HCM Platoon Ratio							1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)							1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh							1.9	0.5	0.0	0.0	3.5	0.0
Incr Delay (d2), s/veh							0.1	0.0	0.0	0.0	0.1	0.0
Initial Q Delay(d3),s/veh							0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln							0.2	0.3	0.0	0.0	1.9	0.0
LnGrp Delay(d),s/veh							2.0	0.5	0.0	0.0	3.6	0.0
LnGrp LOS							A	A			A	
Approach Vol, veh/h								453			737	
Approach Delay, s/veh								0.8			3.6	
Approach LOS								A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6						
Phs Duration (G+Y+Rc), s		38.8			8.4	30.3						
Change Period (Y+Rc), s		6.0			6.0	6.0						
Max Green Setting (Gmax), s		61.0			13.0	42.0						
Max Q Clear Time (g_c+I1), s		2.8			2.6	6.2						
Green Ext Time (p_c), s		9.6			0.1	18.1						
Intersection Summary												
HCM 2010 Ctrl Delay				2.5								
HCM 2010 LOS				A								

HCM 2010 TWSC
4: Jedburg Road & Drop Off Drive

2043 No Build Conditions
AM Peak Hour

Intersection												
Int Delay, s/veh	7.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	43	11	120	63	18	18	70	390	81	23	626	70
Future Vol, veh/h	43	11	120	63	18	18	70	390	81	23	626	70
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	175	-	-	200	-	200	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	22	22	22	22	22	22	11	11	11	11	11	11
Mvmt Flow	46	12	128	67	19	19	74	415	86	24	666	74
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1116	1400	370	950	1351	208	740	0	0	501	0	0
Stage 1	751	751	-	563	563	-	-	-	-	-	-	-
Stage 2	365	649	-	387	788	-	-	-	-	-	-	-
Critical Hdwy	7.94	6.94	7.34	7.94	6.94	7.34	4.32	-	-	4.32	-	-
Critical Hdwy Stg 1	6.94	5.94	-	6.94	5.94	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.94	5.94	-	6.94	5.94	-	-	-	-	-	-	-
Follow-up Hdwy	3.72	4.22	3.52	3.72	4.22	3.52	2.31	-	-	2.31	-	-
Pot Cap-1 Maneuver	139	117	573	187	126	740	806	-	-	999	-	-
Stage 1	327	372	-	431	460	-	-	-	-	-	-	-
Stage 2	575	418	-	557	356	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	108	104	573	122	112	740	806	-	-	999	-	-
Mov Cap-2 Maneuver	108	104	-	122	112	-	-	-	-	-	-	-
Stage 1	297	363	-	391	418	-	-	-	-	-	-	-
Stage 2	485	380	-	409	347	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	28.6		52		1.3		0.3					
HCM LOS	D		F									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR		
Capacity (veh/h)	806	-	-	108	416	122	195	999	-	-		
HCM Lane V/C Ratio	0.092	-	-	0.424	0.335	0.549	0.196	0.024	-	-		
HCM Control Delay (s)	9.9	-	-	60.9	18	65.7	27.9	8.7	-	-		
HCM Lane LOS	A	-	-	F	C	F	D	A	-	-		
HCM 95th %tile Q(veh)	0.3	-	-	1.8	1.4	2.6	0.7	0.1	-	-		

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	3	0	549	1	0	500
Future Vol, veh/h	3	0	549	1	0	500
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	16	16	16	16
Mvmt Flow	3	0	610	1	0	556
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	1167	611	0	0	611	0
Stage 1	611	-	-	-	-	-
Stage 2	556	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.26	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.344	-
Pot Cap-1 Maneuver	214	494	-	-	903	-
Stage 1	542	-	-	-	-	-
Stage 2	574	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	214	494	-	-	903	-
Mov Cap-2 Maneuver	214	-	-	-	-	-
Stage 1	542	-	-	-	-	-
Stage 2	574	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	22.1	0		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	214	903	-	
HCM Lane V/C Ratio	-	-	0.016	-	-	
HCM Control Delay (s)	-	-	22.1	0	-	
HCM Lane LOS	-	-	C	A	-	
HCM 95th %tile Q(veh)	-	-	0	0	-	

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	1	0	549	499	4
Future Vol, veh/h	1	1	0	549	499	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	50	50	16	16	16	16
Mvmt Flow	1	1	0	603	548	4
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1153	550	552	0	-	0
Stage 1	550	-	-	-	-	-
Stage 2	603	-	-	-	-	-
Critical Hdwy	6.9	6.7	4.26	-	-	-
Critical Hdwy Stg 1	5.9	-	-	-	-	-
Critical Hdwy Stg 2	5.9	-	-	-	-	-
Follow-up Hdwy	3.95	3.75	2.344	-	-	-
Pot Cap-1 Maneuver	176	453	951	-	-	-
Stage 1	493	-	-	-	-	-
Stage 2	464	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	176	453	951	-	-	-
Mov Cap-2 Maneuver	176	-	-	-	-	-
Stage 1	493	-	-	-	-	-
Stage 2	464	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	19.3	0		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	951	-	254	-	-	
HCM Lane V/C Ratio	-	-	0.009	-	-	
HCM Control Delay (s)	0	-	19.3	-	-	
HCM Lane LOS	A	-	C	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	

Intersection												
Int Delay, s/veh	136.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔			↔			↔	
Traffic Vol, veh/h	0	0	0	227	3	267	125	282	0	0	474	26
Future Vol, veh/h	0	0	0	227	3	267	125	282	0	0	474	26
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	25	25	25	25	25	25	16	16	16	16	16	16
Mvmt Flow	0	0	0	241	3	284	133	300	0	0	504	28

Major/Minor	Minor1		Major1		Major2		
Conflicting Flow All	1084	1098	300	532	0	-	0
Stage 1	566	566	-	-	-	-	-
Stage 2	518	532	-	-	-	-	-
Critical Hdwy	6.65	6.75	6.45	4.26	-	-	-
Critical Hdwy Stg 1	5.65	5.75	-	-	-	-	-
Critical Hdwy Stg 2	5.65	5.75	-	-	-	-	-
Follow-up Hdwy	3.725	4.225	3.525	2.344	-	-	-
Pot Cap-1 Maneuver	~ 217	193	689	968	-	0	-
Stage 1	525	472	-	-	0	0	-
Stage 2	554	490	-	-	0	0	-
Platoon blocked, %					-	-	-
Mov Cap-1 Maneuver	~ 181	0	689	968	-	-	-
Mov Cap-2 Maneuver	~ 181	0	-	-	-	-	-
Stage 1	438	0	-	-	-	-	-
Stage 2	554	0	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	\$ 383.2	2.9	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBTWBLn1	SBT	SBR
Capacity (veh/h)	968	- 301	-	-
HCM Lane V/C Ratio	0.137	- 1.757	-	-
HCM Control Delay (s)	9.3	\$ 383.2	-	-
HCM Lane LOS	A	A F	-	-
HCM 95th %tile Q(veh)	0.5	- 34.3	-	-

Notes			
-: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

HCM 2010 TWSC
8: I-26 EB Ramp & SC 27

2043 No Build Conditions
AM Peak Hour




Intersection												
Int Delay, s/veh	44.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Traffic Vol, veh/h	47	0	109	0	0	0	0	360	341	329	372	0
Future Vol, veh/h	47	0	109	0	0	0	0	360	341	329	372	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	23	23	23	23	23	23	16	16	16	16	16	16
Mvmt Flow	52	0	120	0	0	0	0	396	375	362	409	0




Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1717	1904	409	-	0	0	771	0	0
Stage 1	1133	1133	-	-	-	-	-	-	-
Stage 2	584	771	-	-	-	-	-	-	-
Critical Hdwy	6.63	6.73	6.43	-	-	-	4.26	-	-
Critical Hdwy Stg 1	5.63	5.73	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.63	5.73	-	-	-	-	-	-	-
Follow-up Hdwy	3.707	4.207	3.507	-	-	-	2.344	-	-
Pot Cap-1 Maneuver	88	61	599	0	-	-	784	-	0
Stage 1	280	254	-	0	-	-	-	-	0
Stage 2	518	381	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	~ 35	0	599	-	-	-	784	-	-
Mov Cap-2 Maneuver	~ 35	0	-	-	-	-	-	-	-
Stage 1	280	0	-	-	-	-	-	-	-
Stage 2	209	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s\$	417.4	0	6.3
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	SBL	SBT
Capacity (veh/h)	-	-	102	784	-
HCM Lane V/C Ratio	-	-	1.681	0.461	-
HCM Control Delay (s)	-	-	\$ 417.4	13.5	0
HCM Lane LOS	-	-	F	B	A
HCM 95th %tile Q(veh)	-	-	13.5	2.5	-

Notes			
-: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	731	510	1
Future Vol, veh/h	0	0	0	731	510	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	16	16	16	16
Mvmt Flow	0	0	0	795	554	1
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1350	555	555	0	-	0
Stage 1	555	-	-	-	-	-
Stage 2	795	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.26	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.344	-	-	-
Pot Cap-1 Maneuver	166	531	949	-	-	-
Stage 1	575	-	-	-	-	-
Stage 2	445	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	166	531	949	-	-	-
Mov Cap-2 Maneuver	166	-	-	-	-	-
Stage 1	575	-	-	-	-	-
Stage 2	445	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	0	0		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	949	-	-	-	-	
HCM Lane V/C Ratio	-	-	-	-	-	
HCM Control Delay (s)	0	-	0	-	-	
HCM Lane LOS	A	-	A	-	-	
HCM 95th %tile Q(veh)	0	-	-	-	-	

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	7	724	1	1	509
Future Vol, veh/h	2	7	724	1	1	509
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	21	21	21	21
Mvmt Flow	2	8	796	1	1	559
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	1358	797	0	0	797	0
Stage 1	797	-	-	-	-	-
Stage 2	561	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.31	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.389	-
Pot Cap-1 Maneuver	164	387	-	-	747	-
Stage 1	444	-	-	-	-	-
Stage 2	571	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	164	387	-	-	747	-
Mov Cap-2 Maneuver	164	-	-	-	-	-
Stage 1	444	-	-	-	-	-
Stage 2	570	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	17.5	0		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	297	747	-	
HCM Lane V/C Ratio	-	-	0.033	0.001	-	
HCM Control Delay (s)	-	-	17.5	9.8	0	
HCM Lane LOS	-	-	C	A	A	
HCM 95th %tile Q(veh)	-	-	0.1	0	-	

Intersection												
Int Delay, s/veh	3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	8	8	31	39	4	19	10	207	46	16	134	1
Future Vol, veh/h	8	8	31	39	4	19	10	207	46	16	134	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	23	23	23	23	23	23	36	36	36	36	36	36
Mvmt Flow	9	9	34	43	4	21	11	230	51	18	149	1




Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	476	489	150	485	464	256	150	0	0	281	0	0
Stage 1	186	186	-	278	278	-	-	-	-	-	-	-
Stage 2	290	303	-	207	186	-	-	-	-	-	-	-
Critical Hdwy	7.33	6.73	6.43	7.33	6.73	6.43	4.46	-	-	4.46	-	-
Critical Hdwy Stg 1	6.33	5.73	-	6.33	5.73	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.33	5.73	-	6.33	5.73	-	-	-	-	-	-	-
Follow-up Hdwy	3.707	4.207	3.507	3.707	4.207	3.507	2.524	-	-	2.524	-	-
Pot Cap-1 Maneuver	466	450	844	460	466	734	1248	-	-	1109	-	-
Stage 1	769	708	-	685	644	-	-	-	-	-	-	-
Stage 2	675	627	-	749	708	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	439	437	844	425	452	734	1248	-	-	1109	-	-
Mov Cap-2 Maneuver	439	437	-	425	452	-	-	-	-	-	-	-
Stage 1	761	695	-	677	637	-	-	-	-	-	-	-
Stage 2	644	620	-	696	695	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	11.1		13.5		0.3		0.9	
HCM LOS	B		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1248	-	-	642 490	1109	-	-
HCM Lane V/C Ratio	0.009	-	-	0.081 0.141	0.016	-	-
HCM Control Delay (s)	7.9	0	-	11.1 13.5	8.3	0	-
HCM Lane LOS	A	A	-	B B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.3 0.5	0	-	-

























Intersection												
Int Delay, s/veh	4.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					<div>↕</div>			<div>↕</div>			<div>↕</div>	
Traffic Vol, veh/h	0	0	0	71	3	118	33	145	0	0	174	30
Future Vol, veh/h	0	0	0	71	3	118	33	145	0	0	174	30
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	46	46	46	46	46	46	36	36	36	36	36	36
Mvmt Flow	0	0	0	76	3	126	35	154	0	0	185	32
Major/Minor				Minor1		Major1		Major2				
Conflicting Flow All				425	441	154	217	0	-	-	-	0
Stage 1				224	224	-	-	-	-	-	-	-
Stage 2				201	217	-	-	-	-	-	-	-
Critical Hdwy				6.86	6.96	6.66	4.46	-	-	-	-	-
Critical Hdwy Stg 1				5.86	5.96	-	-	-	-	-	-	-
Critical Hdwy Stg 2				5.86	5.96	-	-	-	-	-	-	-
Follow-up Hdwy				3.914	4.414	3.714	2.524	-	-	-	-	-
Pot Cap-1 Maneuver				511	450	788	1175	-	0	0	-	-
Stage 1				720	644	-	-	-	0	0	-	-
Stage 2				738	649	-	-	-	0	0	-	-
Platoon blocked, %								-			-	-
Mov Cap-1 Maneuver				494	0	788	1175	-	-	-	-	-
Mov Cap-2 Maneuver				494	0	-	-	-	-	-	-	-
Stage 1				696	0	-	-	-	-	-	-	-
Stage 2				738	0	-	-	-	-	-	-	-
Approach				WB		NB		SB				
HCM Control Delay, s				13.2		1.5		0				
HCM LOS				B								
Minor Lane/Major Mvmt		NBL	NBTWBLn1	SBT	SBR							
Capacity (veh/h)		1175	-	644	-	-						
HCM Lane V/C Ratio		0.03	-	0.317	-	-						
HCM Control Delay (s)		8.2	0	13.2	-	-						
HCM Lane LOS		A	A	B	-	-						
HCM 95th %tile Q(veh)		0.1	-	1.4	-	-						

Intersection												
Int Delay, s/veh	3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Traffic Vol, veh/h	34	3	30	0	0	0	0	144	83	85	160	0
Future Vol, veh/h	34	3	30	0	0	0	0	144	83	85	160	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	53	53	53	53	53	53	36	36	36	36	36	36
Mvmt Flow	38	3	33	0	0	0	0	160	92	94	178	0
Major/Minor	Minor2						Major1		Major2			
Conflicting Flow All	572	618	178				-	0	0	252	0	0
Stage 1	366	366	-				-	-	-	-	-	-
Stage 2	206	252	-				-	-	-	-	-	-
Critical Hdwy	6.93	7.03	6.73				-	-	-	4.46	-	-
Critical Hdwy Stg 1	5.93	6.03	-				-	-	-	-	-	-
Critical Hdwy Stg 2	5.93	6.03	-				-	-	-	-	-	-
Follow-up Hdwy	3.977	4.477	3.777				-	-	-	2.524	-	-
Pot Cap-1 Maneuver	406	345	749				0	-	-	1139	-	0
Stage 1	602	542	-				0	-	-	-	-	0
Stage 2	721	614	-				0	-	-	-	-	0
Platoon blocked, %								-	-	-		
Mov Cap-1 Maneuver	369	0	749				-	-	-	1139	-	-
Mov Cap-2 Maneuver	369	0	-				-	-	-	-	-	-
Stage 1	602	0	-				-	-	-	-	-	-
Stage 2	655	0	-				-	-	-	-	-	-
Approach	EB						NB		SB			
HCM Control Delay, s	13.8						0		2.9			
HCM LOS	B											
Minor Lane/Major Mvmt		NBT	NBR	EBLn1	SBL	SBT						
Capacity (veh/h)		-	-	484	1139	-						
HCM Lane V/C Ratio		-	-	0.154	0.083	-						
HCM Control Delay (s)		-	-	13.8	8.4	0						
HCM Lane LOS		-	-	B	A	A						
HCM 95th %tile Q(veh)		-	-	0.5	0.3	-						

Intersection						
Int Delay, s/veh	6.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	81	100	66	146	134	56
Future Vol, veh/h	81	100	66	146	134	56
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	19	19	36	36	36	36
Mvmt Flow	89	110	73	160	147	62
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	233	0	-	0	441	153
Stage 1	-	-	-	-	153	-
Stage 2	-	-	-	-	288	-
Critical Hdwy	4.29	-	-	-	6.76	6.56
Critical Hdwy Stg 1	-	-	-	-	5.76	-
Critical Hdwy Stg 2	-	-	-	-	5.76	-
Follow-up Hdwy	2.371	-	-	-	3.824	3.624
Pot Cap-1 Maneuver	1241	-	-	-	515	811
Stage 1	-	-	-	-	799	-
Stage 2	-	-	-	-	689	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1241	-	-	-	476	811
Mov Cap-2 Maneuver	-	-	-	-	476	-
Stage 1	-	-	-	-	738	-
Stage 2	-	-	-	-	689	-
Approach	EB	WB		SB		
HCM Control Delay, s	3.6	0		15.7		
HCM LOS				C		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1241	-	-	-	542	
HCM Lane V/C Ratio	0.072	-	-	-	0.385	
HCM Control Delay (s)	8.1	0	-	-	15.7	
HCM Lane LOS	A	A	-	-	C	
HCM 95th %tile Q(veh)	0.2	-	-	-	1.8	










HCM 2010 Signalized Intersection Summary
15: Volvo Car Drive & Welcome Center/Factory Entrance

2043 No Build Conditions
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	0	13	161	0	54	97	801	30	11	451	32
Future Volume (veh/h)	4	0	13	161	0	54	97	801	30	11	451	32
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727
Adj Flow Rate, veh/h	4	0	14	175	0	59	105	871	33	12	490	35
Adj No. of Lanes	1	1	1	1	1	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	10	10	10	10	10	10	10	10	10	10	10	10
Cap, veh/h	138	67	57	302	238	202	446	987	839	179	924	785
Arrive On Green	0.00	0.00	0.04	0.10	0.00	0.14	0.05	0.57	0.57	0.01	0.53	0.53
Sat Flow, veh/h	1645	1727	1468	1645	1727	1468	1645	1727	1468	1645	1727	1468
Grp Volume(v), veh/h	4	0	14	175	0	59	105	871	33	12	490	35
Grp Sat Flow(s),veh/h/ln	1645	1727	1468	1645	1727	1468	1645	1727	1468	1645	1727	1468
Q Serve(g_s), s	0.2	0.0	0.8	8.7	0.0	3.1	2.5	38.0	0.9	0.3	16.1	1.0
Cycle Q Clear(g_c), s	0.2	0.0	0.8	8.7	0.0	3.1	2.5	38.0	0.9	0.3	16.1	1.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	138	67	57	302	238	202	446	987	839	179	924	785
V/C Ratio(X)	0.03	0.00	0.25	0.58	0.00	0.29	0.24	0.88	0.04	0.07	0.53	0.04
Avail Cap(c_a), veh/h	300	317	269	302	317	269	536	1030	875	329	1030	875
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.0	0.0	40.7	34.1	0.0	33.8	9.8	16.2	8.2	16.2	13.2	9.7
Incr Delay (d2), s/veh	0.1	0.0	2.2	2.7	0.0	0.8	0.3	8.9	0.0	0.2	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.4	4.1	0.0	1.3	1.1	20.3	0.3	0.1	7.7	0.4
LnGrp Delay(d),s/veh	40.1	0.0	42.9	36.8	0.0	34.6	10.1	25.1	8.2	16.3	13.7	9.7
LnGrp LOS	D		D	D		C	B	C	A	B	B	A
Approach Vol, veh/h	18		234				1009				537	
Approach Delay, s/veh	42.3		36.2				23.0				13.5	
Approach LOS	D		D				C				B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.2	52.6	6.4	18.0	7.0	55.8	15.0	9.4				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	9.0	52.0	9.0	16.0	9.0	52.0	9.0	16.0				
Max Q Clear Time (g_c+I1), s	4.5	18.1	2.2	5.1	2.3	40.0	10.7	2.8				
Green Ext Time (p_c), s	0.1	11.8	0.0	0.1	0.0	9.8	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay	22.0											
HCM 2010 LOS	C											

HCM 2010 TWSC
1: Jedburg Road & Old Dairy Road

2043 No Build Conditions
PM Peak Hour

Intersection												
Int Delay, s/veh	432.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	88	10	72	14	14	205	37	810	30	132	983	147
Future Vol, veh/h	88	10	72	14	14	205	37	810	30	132	983	147
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Yield	-	-	None	-	-	None
Storage Length	0	-	250	150	-	150	175	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	9	9	9	9	9	9	7	7	7	7	7	7
Mvmt Flow	97	11	79	15	15	225	41	890	33	145	1080	162

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1986	2456	621	1825	2521	462	1242	0	0	923	0	0
Stage 1	1451	1451	-	989	989	-	-	-	-	-	-	-
Stage 2	535	1005	-	836	1532	-	-	-	-	-	-	-
Critical Hdwy	7.68	6.68	7.08	7.68	6.68	7.08	4.24	-	-	4.24	-	-
Critical Hdwy Stg 1	6.68	5.68	-	6.68	5.68	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.68	5.68	-	6.68	5.68	-	-	-	-	-	-	-
Follow-up Hdwy	3.59	4.09	3.39	3.59	4.09	3.39	2.27	-	-	2.27	-	-
Pot Cap-1 Maneuver	~ 33	27	414	44	25	528	530	-	-	705	-	-
Stage 1	128	182	-	252	308	-	-	-	-	-	-	-
Stage 2	479	302	-	313	166	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	~ 4	20	414	16	18	528	530	-	-	705	-	-
Mov Cap-2 Maneuver	~ 4	20	-	16	18	-	-	-	-	-	-	-
Stage 1	118	145	-	233	284	-	-	-	-	-	-	-
Stage 2	240	279	-	186	132	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, \$ 6359.6		74	0.5	1.2
HCM LOS	F	F		


Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	530	-	-	4	122	16	18	528	705	-	-
HCM Lane V/C Ratio	0.077	-	-	24.176	0.739	0.962	0.855	0.427	0.206	-	-
HCM Control Delay (s)	12.4	-	-	\$ 12200.9	90.9\$	533.5\$	451.6	16.8	11.4	-	-
HCM Lane LOS	B	-	-	F	F	F	F	C	B	-	-
HCM 95th %tile Q(veh)	0.2	-	-	14.2	4.2	2.4	2.2	2.1	0.8	-	-

Notes											
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined				*: All major volume in platoon			

HCM 2010 Signalized Intersection Summary

2: Jedburg Road & I-26 EB Ramps




















2043 No Build Conditions
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↩	↩					↩↩	↩	↩	↩↩	
Traffic Volume (veh/h)	74	3	125	0	0	0	0	476	627	194	1137	0
Future Volume (veh/h)	74	3	125	0	0	0	0	476	627	194	1137	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1597	1597				0	1776	1776	1776	1776	0
Adj Flow Rate, veh/h	78	3	132				0	501	660	204	1197	0
Adj No. of Lanes	0	1	1				0	2	1	1	2	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	19	19	19				0	7	7	7	7	0
Cap, veh/h	195	7	180				0	1813	811	443	2360	0
Arrive On Green	0.13	0.13	0.13				0.00	0.54	0.54	0.08	0.70	0.00
Sat Flow, veh/h	1467	56	1357				0	3463	1509	1691	3463	0
Grp Volume(v), veh/h	81	0	132				0	501	660	204	1197	0
Grp Sat Flow(s),veh/h/ln	1523	0	1357				0	1687	1509	1691	1687	0
Q Serve(g_s), s	3.5	0.0	6.7				0.0	5.8	25.7	3.5	11.8	0.0
Cycle Q Clear(g_c), s	3.5	0.0	6.7				0.0	5.8	25.7	3.5	11.8	0.0
Prop In Lane	0.96		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	202	0	180				0	1813	811	443	2360	0
V/C Ratio(X)	0.40	0.00	0.73				0.00	0.28	0.81	0.46	0.51	0.00
Avail Cap(c_a), veh/h	341	0	304				0	2218	992	523	2925	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	28.4	0.0	29.8				0.0	9.0	13.6	5.9	5.0	0.0
Incr Delay (d2), s/veh	1.3	0.0	5.7				0.0	0.1	4.4	0.7	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	2.8				0.0	2.7	11.6	1.7	5.4	0.0
LnGrp Delay(d),s/veh	29.7	0.0	35.5				0.0	9.1	18.0	6.7	5.2	0.0
LnGrp LOS	C		D					A	B	A	A	
Approach Vol, veh/h		213						1161			1401	
Approach Delay, s/veh		33.3						14.1			5.4	
Approach LOS		C						B			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	11.6	44.4		15.5		56.0						
Change Period (Y+Rc), s	6.0	6.0		6.0		6.0						
Max Green Setting (Gmax), s	9.0	47.0		16.0		62.0						
Max Q Clear Time (g_c+I1), s	5.5	27.7		8.7		13.8						
Green Ext Time (p_c), s	0.2	10.7		0.9		35.7						
Intersection Summary												
HCM 2010 Ctrl Delay			11.2									
HCM 2010 LOS			B									

HCM 2010 Signalized Intersection Summary










3: Jedburg Road & I-26 WB Ramps

2043 No Build Conditions
PM Peak Hour

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	0	355	107	443	0	0	529	91
Future Volume (veh/h)	0	0	0	0	0	355	107	443	0	0	529	91
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				0	0	1792	1776	1776	0	0	1776	1776
Adj Flow Rate, veh/h				0	0	374	113	466	0	0	557	0
Adj No. of Lanes				0	0	1	1	2	0	0	2	1
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				0	0	6	7	7	0	0	7	7
Cap, veh/h				0	0	0	724	2719	0	0	1793	802
Arrive On Green				0.00	0.00	0.00	0.08	0.81	0.00	0.00	0.53	0.00
Sat Flow, veh/h					0		1691	3463	0	0	3463	1509
Grp Volume(v), veh/h					0.0		113	466	0	0	557	0
Grp Sat Flow(s),veh/h/ln							1691	1687	0	0	1687	1509
Q Serve(g_s), s							0.7	1.0	0.0	0.0	2.9	0.0
Cycle Q Clear(g_c), s							0.7	1.0	0.0	0.0	2.9	0.0
Prop In Lane							1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h							724	2719	0	0	1793	802
V/C Ratio(X)							0.16	0.17	0.00	0.00	0.31	0.00
Avail Cap(c_a), veh/h							1190	5349	0	0	3493	1563
HCM Platoon Ratio							1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)							1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh							2.2	0.7	0.0	0.0	4.1	0.0
Incr Delay (d2), s/veh							0.1	0.0	0.0	0.0	0.1	0.0
Initial Q Delay(d3),s/veh							0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln							0.3	0.4	0.0	0.0	1.3	0.0
LnGrp Delay(d),s/veh							2.3	0.7	0.0	0.0	4.2	0.0
LnGrp LOS							A	A			A	
Approach Vol, veh/h								579			557	
Approach Delay, s/veh								1.0			4.2	
Approach LOS								A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6						
Phs Duration (G+Y+Rc), s		30.9			8.5	22.4						
Change Period (Y+Rc), s		6.0			6.0	6.0						
Max Green Setting (Gmax), s		49.0			11.0	32.0						
Max Q Clear Time (g_c+I1), s		3.0			2.7	4.9						
Green Ext Time (p_c), s		12.0			0.2	11.6						
Intersection Summary												
HCM 2010 Ctrl Delay			2.6									
HCM 2010 LOS			A									

HCM 2010 TWSC
4: Jedburg Road & Drop Off Drive




2043 No Build Conditions
PM Peak Hour




Intersection												
Int Delay, s/veh	11.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	36	10	105	88	10	33	91	649	58	18	427	76
Future Vol, veh/h	36	10	105	88	10	33	91	649	58	18	427	76
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	175	-	-	200	-	200	175	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	8	8	8	8	8	8	7	7	7	7	7	7
Mvmt Flow	39	11	113	95	11	35	98	698	62	19	459	82

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1089	1494	271	1167	1473	349	541	0	0	760	0	0
Stage 1	538	538	-	894	894	-	-	-	-	-	-	-
Stage 2	551	956	-	273	579	-	-	-	-	-	-	-
Critical Hdwy	7.66	6.66	7.06	7.66	6.66	7.06	4.24	-	-	4.24	-	-
Critical Hdwy Stg 1	6.66	5.66	-	6.66	5.66	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.66	5.66	-	6.66	5.66	-	-	-	-	-	-	-
Follow-up Hdwy	3.58	4.08	3.38	3.58	4.08	3.38	2.27	-	-	2.27	-	-
Pot Cap-1 Maneuver	162	115	709	142	119	630	990	-	-	816	-	-
Stage 1	480	506	-	290	344	-	-	-	-	-	-	-
Stage 2	471	321	-	693	484	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	128	101	709	100	105	630	990	-	-	816	-	-
Mov Cap-2 Maneuver	128	101	-	100	105	-	-	-	-	-	-	-
Stage 1	432	494	-	261	310	-	-	-	-	-	-	-
Stage 2	387	289	-	557	473	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	22.5		109.4		1		0.3	
HCM LOS	C		F					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	990	-	-	128	465	100	291	816	-	-
HCM Lane V/C Ratio	0.099	-	-	0.302	0.266	0.946	0.159	0.024	-	-
HCM Control Delay (s)	9	-	-	44.9	15.5	153.3	19.7	9.5	-	-
HCM Lane LOS	A	-	-	E	C	F	C	A	-	-
HCM 95th %tile Q(veh)	0.3	-	-	1.2	1.1	5.6	0.6	0.1	-	-

Intersection						
Int Delay, s/veh	0.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	9	1	596	6	3	766
Future Vol, veh/h	9	1	596	6	3	766
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	7	7	7	7
Mvmt Flow	10	1	662	7	3	851
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	1523	666	0	0	669	0
Stage 1	666	-	-	-	-	-
Stage 2	857	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.17	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.263	-
Pot Cap-1 Maneuver	130	459	-	-	898	-
Stage 1	511	-	-	-	-	-
Stage 2	416	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	129	459	-	-	898	-
Mov Cap-2 Maneuver	129	-	-	-	-	-
Stage 1	508	-	-	-	-	-
Stage 2	416	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	33.1	0		0		
HCM LOS	D					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	-		139	898	
HCM Lane V/C Ratio	-	-		0.08	0.004	
HCM Control Delay (s)	-	-		33.1	9	
HCM Lane LOS	-	-		D	A	
HCM 95th %tile Q(veh)	-	-		0.3	0	

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	1	0	601	772	3
Future Vol, veh/h	1	1	0	601	772	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	50	50	7	7	7	7
Mvmt Flow	1	1	0	668	858	3
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1528	860	861	0	-	0
Stage 1	860	-	-	-	-	-
Stage 2	668	-	-	-	-	-
Critical Hdwy	6.9	6.7	4.17	-	-	-
Critical Hdwy Stg 1	5.9	-	-	-	-	-
Critical Hdwy Stg 2	5.9	-	-	-	-	-
Follow-up Hdwy	3.95	3.75	2.263	-	-	-
Pot Cap-1 Maneuver	100	293	760	-	-	-
Stage 1	344	-	-	-	-	-
Stage 2	430	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	100	293	760	-	-	-
Mov Cap-2 Maneuver	100	-	-	-	-	-
Stage 1	344	-	-	-	-	-
Stage 2	430	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	29.5	0		0		
HCM LOS	D					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	760	-	149	-	-	
HCM Lane V/C Ratio	-	-	0.015	-	-	
HCM Control Delay (s)	0	-	29.5	-	-	
HCM Lane LOS	A	-	D	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	

Intersection												
Int Delay, s/veh	346.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔			↔			↔	
Traffic Vol, veh/h	0	0	0	289	3	380	119	221	0	0	690	83
Future Vol, veh/h	0	0	0	289	3	380	119	221	0	0	690	83
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	7	7	7	7	7	7	7	7	7	7	7	7
Mvmt Flow	0	0	0	321	3	422	132	246	0	0	767	92

Major/Minor	Minor1	Major1	Major2									
Conflicting Flow All	1323	1369	246	859	0	-	-	-	-	0		
Stage 1	510	510	-	-	-	-	-	-	-	-		
Stage 2	813	859	-	-	-	-	-	-	-	-		
Critical Hdwy	6.47	6.57	6.27	4.17	-	-	-	-	-	-		
Critical Hdwy Stg 1	5.47	5.57	-	-	-	-	-	-	-	-		
Critical Hdwy Stg 2	5.47	5.57	-	-	-	-	-	-	-	-		
Follow-up Hdwy	3.563	4.063	3.363	2.263	-	-	-	-	-	-		
Pot Cap-1 Maneuver	~ 168	143	781	761	-	0	0	-	-	-		
Stage 1	593	529	-	-	-	0	0	-	-	-		
Stage 2	428	366	-	-	-	0	0	-	-	-		
Platoon blocked, %					-			-		-		
Mov Cap-1 Maneuver	~ 134	0	781	761	-	-	-	-	-	-		
Mov Cap-2 Maneuver	~ 134	0	-	-	-	-	-	-	-	-		
Stage 1	474	0	-	-	-	-	-	-	-	-		
Stage 2	428	0	-	-	-	-	-	-	-	-		

Approach	WB	NB	SB
HCM Control Delay, s	\$ 918.3	3.8	0
HCM LOS	F		




Minor Lane/Major Mvmt	NBL	NBTWBLn1	SBT	SBR
Capacity (veh/h)	761	- 253	-	-
HCM Lane V/C Ratio	0.174	- 2.951	-	-
HCM Control Delay (s)	10.7	\$ 918.3	-	-
HCM Lane LOS	B	A F	-	-
HCM 95th %tile Q(veh)	0.6	- 66	-	-




Notes			
-: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

HCM 2010 TWSC
8: I-26 EB Ramp & SC 27

2043 No Build Conditions
PM Peak Hour

Intersection												
Int Delay, s/veh	107.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↵			↕	
Traffic Vol, veh/h	30	0	148	0	0	0	0	310	233	453	526	0
Future Vol, veh/h	30	0	148	0	0	0	0	310	233	453	526	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	8	8	8	8	8	8	7	7	7	7	7	7
Mvmt Flow	33	0	164	0	0	0	0	344	259	503	584	0
Major/Minor	Minor2			Major1			Major2					
Conflicting Flow All	2064	2193	584				-	0	0	603	0	0
Stage 1	1590	1590	-				-	-	-	-	-	-
Stage 2	474	603	-				-	-	-	-	-	-
Critical Hdwy	6.48	6.58	6.28				-	-	-	4.17	-	-
Critical Hdwy Stg 1	5.48	5.58	-				-	-	-	-	-	-
Critical Hdwy Stg 2	5.48	5.58	-				-	-	-	-	-	-
Follow-up Hdwy	3.572	4.072	3.372				-	-	-	2.263	-	-
Pot Cap-1 Maneuver	58	43	500				0	-	-	951	-	0
Stage 1	178	162	-				0	-	-	-	-	0
Stage 2	614	479	-				0	-	-	-	-	0
Platoon blocked, %								-	-	-	-	
Mov Cap-1 Maneuver	~ 13	0	500				-	-	-	951	-	-
Mov Cap-2 Maneuver	~ 13	0	-				-	-	-	-	-	-
Stage 1	39	0	-				-	-	-	-	-	-
Stage 2	614	0	-				-	-	-	-	-	-
Approach	EB			NB			SB					
HCM Control Delay, s	\$ 991			0			6					
HCM LOS	F											
Minor Lane/Major Mvmt	NBT	NBR	EBLn1	SBL	SBT							
Capacity (veh/h)	-	-	68	951	-							
HCM Lane V/C Ratio	-	-	2.908	0.529	-							
HCM Control Delay (s)	-	-	\$ 991	13	0							
HCM Lane LOS	-	-	F	B	A							
HCM 95th %tile Q(veh)	-	-	19.9	3.2	-							
Notes												
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon						

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	0	1	572	703	1
Future Vol, veh/h	1	0	1	572	703	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	7	7	7	7
Mvmt Flow	1	0	1	609	748	1
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1360	749	749	0	-	0
Stage 1	749	-	-	-	-	-
Stage 2	611	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.17	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.263	-	-	-
Pot Cap-1 Maneuver	164	412	838	-	-	-
Stage 1	467	-	-	-	-	-
Stage 2	542	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	164	412	838	-	-	-
Mov Cap-2 Maneuver	164	-	-	-	-	-
Stage 1	466	-	-	-	-	-
Stage 2	542	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	27.1	0		0		
HCM LOS	D					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	838	-	164	-	-	
HCM Lane V/C Ratio	0.001	-	0.006	-	-	
HCM Control Delay (s)	9.3	0	27.1	-	-	
HCM Lane LOS	A	A	D	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	

Intersection						
Int Delay, s/veh	0.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	6	6	567	10	12	691
Future Vol, veh/h	6	6	567	10	12	691
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	11	11	11	11
Mvmt Flow	6	6	603	11	13	735
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	1370	609	0	0	614	0
Stage 1	609	-	-	-	-	-
Stage 2	761	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.21	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.299	-
Pot Cap-1 Maneuver	161	495	-	-	923	-
Stage 1	543	-	-	-	-	-
Stage 2	461	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	157	495	-	-	923	-
Mov Cap-2 Maneuver	157	-	-	-	-	-
Stage 1	530	-	-	-	-	-
Stage 2	461	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	21	0		0.2		
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	238	923	-	
HCM Lane V/C Ratio	-	-	0.054	0.014	-	
HCM Control Delay (s)	-	-	21	9	0	
HCM Lane LOS	-	-	C	A	A	
HCM 95th %tile Q(veh)	-	-	0.2	0	-	

Intersection												
Int Delay, s/veh	5.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	8	3	28	126	11	21	25	157	36	21	178	15
Future Vol, veh/h	8	3	28	126	11	21	25	157	36	21	178	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	8	8	8	8	8	8	24	24	24	24	24	24
Mvmt Flow	9	3	31	138	12	23	27	173	40	23	196	16

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	515	517	204	514	505	193	212	0	0	213	0	0
Stage 1	250	250	-	247	247	-	-	-	-	-	-	-
Stage 2	265	267	-	267	258	-	-	-	-	-	-	-
Critical Hdwy	7.18	6.58	6.28	7.18	6.58	6.28	4.34	-	-	4.34	-	-
Critical Hdwy Stg 1	6.18	5.58	-	6.18	5.58	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.18	5.58	-	6.18	5.58	-	-	-	-	-	-	-
Follow-up Hdwy	3.572	4.072	3.372	3.572	4.072	3.372	2.416	-	-	2.416	-	-
Pot Cap-1 Maneuver	461	454	822	462	461	833	1238	-	-	1237	-	-
Stage 1	741	689	-	744	691	-	-	-	-	-	-	-
Stage 2	727	677	-	725	683	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	424	434	822	427	440	833	1238	-	-	1237	-	-
Mov Cap-2 Maneuver	424	434	-	427	440	-	-	-	-	-	-	-
Stage 1	722	675	-	725	674	-	-	-	-	-	-	-
Stage 2	677	660	-	680	669	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	10.9		17.6		0.9		0.8	
HCM LOS	B		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1238	-	-	652	458	1237	-
HCM Lane V/C Ratio	0.022	-	-	0.066	0.379	0.019	-
HCM Control Delay (s)	8	0	-	10.9	17.6	8	0
HCM Lane LOS	A	A	-	B	C	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0.2	1.7	0.1	-




Intersection												
Int Delay, s/veh	4.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕			↕			↕	
Traffic Vol, veh/h	0	0	0	95	0	103	34	115	0	0	297	35
Future Vol, veh/h	0	0	0	95	0	103	34	115	0	0	297	35
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	21	21	21	21	21	21	24	24	24	24	24	24
Mvmt Flow	0	0	0	106	0	114	38	128	0	0	330	39
Major/Minor				Minor1		Major1		Major2				
Conflicting Flow All				554	573	128	369	0	-	-	-	0
Stage 1				204	204	-	-	-	-	-	-	-
Stage 2				350	369	-	-	-	-	-	-	-
Critical Hdwy				6.61	6.71	6.41	4.34	-	-	-	-	-
Critical Hdwy Stg 1				5.61	5.71	-	-	-	-	-	-	-
Critical Hdwy Stg 2				5.61	5.71	-	-	-	-	-	-	-
Follow-up Hdwy				3.689	4.189	3.489	2.416	-	-	-	-	-
Pot Cap-1 Maneuver				462	405	874	1078	-	0	0	-	-
Stage 1				787	699	-	-	-	0	0	-	-
Stage 2				673	589	-	-	-	0	0	-	-
Platoon blocked, %								-			-	-
Mov Cap-1 Maneuver				444	0	874	1078	-	-	-	-	-
Mov Cap-2 Maneuver				444	0	-	-	-	-	-	-	-
Stage 1				757	0	-	-	-	-	-	-	-
Stage 2				673	0	-	-	-	-	-	-	-
Approach				WB		NB		SB				
HCM Control Delay, s				14.5		1.9		0				
HCM LOS				B								
Minor Lane/Major Mvmt		NBL	NBTWBLn1	SBT	SBR							
Capacity (veh/h)		1078	-	597	-	-						
HCM Lane V/C Ratio		0.035	-	0.369	-	-						
HCM Control Delay (s)		8.5	0	14.5	-	-						
HCM Lane LOS		A	A	B	-	-						
HCM 95th %tile Q(veh)		0.1	-	1.7	-	-						

Intersection												
Int Delay, s/veh	2.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Traffic Vol, veh/h	13	0	24	0	0	0	0	136	66	128	264	0
Future Vol, veh/h	13	0	24	0	0	0	0	136	66	128	264	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	52	52	52	52	52	52	24	24	24	24	24	24
Mvmt Flow	14	0	27	0	0	0	0	151	73	142	293	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	765	801	293	-	0	0	224	0	0
Stage 1	577	577	-	-	-	-	-	-	-
Stage 2	188	224	-	-	-	-	-	-	-
Critical Hdwy	6.92	7.02	6.72	-	-	-	4.34	-	-
Critical Hdwy Stg 1	5.92	6.02	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.92	6.02	-	-	-	-	-	-	-
Follow-up Hdwy	3.968	4.468	3.768	-	-	-	2.416	-	-
Pot Cap-1 Maneuver	309	267	642	0	-	-	1225	-	0
Stage 1	475	430	-	0	-	-	-	-	0
Stage 2	737	635	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	266	0	642	-	-	-	1225	-	-
Mov Cap-2 Maneuver	266	0	-	-	-	-	-	-	-
Stage 1	409	0	-	-	-	-	-	-	-
Stage 2	737	0	-	-	-	-	-	-	-

























Approach	EB	NB	SB
HCM Control Delay, s	14.3	0	2.7
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	SBL	SBT
Capacity (veh/h)	-	-	429	1225	-
HCM Lane V/C Ratio	-	-	0.096	0.116	-
HCM Control Delay (s)	-	-	14.3	8.3	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0.4	-

Intersection						
Int Delay, s/veh	8.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	43	106	146	159	209	79
Future Vol, veh/h	43	106	146	159	209	79
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	6	6	24	24	24	24
Mvmt Flow	48	118	162	177	232	88
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	339	0	-	0	465	251
Stage 1	-	-	-	-	251	-
Stage 2	-	-	-	-	214	-
Critical Hdwy	4.16	-	-	-	6.64	6.44
Critical Hdwy Stg 1	-	-	-	-	5.64	-
Critical Hdwy Stg 2	-	-	-	-	5.64	-
Follow-up Hdwy	2.254	-	-	-	3.716	3.516
Pot Cap-1 Maneuver	1198	-	-	-	517	737
Stage 1	-	-	-	-	742	-
Stage 2	-	-	-	-	772	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1198	-	-	-	495	737
Mov Cap-2 Maneuver	-	-	-	-	495	-
Stage 1	-	-	-	-	710	-
Stage 2	-	-	-	-	772	-
Approach	EB	WB		SB		
HCM Control Delay, s	2.3	0		20.6		
HCM LOS				C		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1198	-	-	-	544	
HCM Lane V/C Ratio	0.04	-	-	-	0.588	
HCM Control Delay (s)	8.1	0	-	-	20.6	
HCM Lane LOS	A	A	-	-	C	
HCM 95th %tile Q(veh)	0.1	-	-	-	3.8	

HCM 2010 Signalized Intersection Summary
15: Volvo Car Drive & Welcome Center/Factory Entrance

2043 No Build Conditions
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	56	0	171	15	0	4	32	386	15	4	593	12
Future Volume (veh/h)	56	0	171	15	0	4	32	386	15	4	593	12
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727
Adj Flow Rate, veh/h	61	0	186	16	0	4	35	420	16	4	645	13
Adj No. of Lanes	1	1	1	1	1	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	10	10	10	10	10	10	10	10	10	10	10	10
Cap, veh/h	345	268	228	275	222	188	233	806	685	374	764	649
Arrive On Green	0.04	0.00	0.16	0.02	0.00	0.13	0.03	0.47	0.47	0.00	0.44	0.44
Sat Flow, veh/h	1645	1727	1468	1645	1727	1468	1645	1727	1468	1645	1727	1468
Grp Volume(v), veh/h	61	0	186	16	0	4	35	420	16	4	645	13
Grp Sat Flow(s),veh/h/ln	1645	1727	1468	1645	1727	1468	1645	1727	1468	1645	1727	1468
Q Serve(g_s), s	2.1	0.0	8.2	0.6	0.0	0.2	0.8	11.5	0.4	0.1	22.3	0.3
Cycle Q Clear(g_c), s	2.1	0.0	8.2	0.6	0.0	0.2	0.8	11.5	0.4	0.1	22.3	0.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	345	268	228	275	222	188	233	806	685	374	764	649
V/C Ratio(X)	0.18	0.00	0.82	0.06	0.00	0.02	0.15	0.52	0.02	0.01	0.84	0.02
Avail Cap(c_a), veh/h	496	413	351	471	413	351	407	825	702	588	825	702
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.9	0.0	27.4	24.8	0.0	25.5	13.5	12.6	9.6	11.0	16.6	10.5
Incr Delay (d2), s/veh	0.2	0.0	8.4	0.1	0.0	0.0	0.3	0.6	0.0	0.0	7.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	3.9	0.3	0.0	0.1	0.4	5.5	0.2	0.0	12.2	0.1
LnGrp Delay(d),s/veh	24.2	0.0	35.7	24.9	0.0	25.6	13.8	13.1	9.6	11.0	24.2	10.5
LnGrp LOS	C		D	C		C	B	B	A	B	C	B
Approach Vol, veh/h	247						20		471		662	
Approach Delay, s/veh	32.9						25.0		13.1		23.8	
Approach LOS	C						C		B		C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.9	35.6	8.8	14.6	6.3	37.2	7.0	16.4				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	9.0	32.0	9.0	16.0	9.0	32.0	9.0	16.0				
Max Q Clear Time (g_c+I1), s	2.8	24.3	4.1	2.2	2.1	13.5	2.6	10.2				
Green Ext Time (p_c), s	0.0	5.4	0.0	0.0	0.0	7.1	0.0	0.3				
Intersection Summary												
HCM 2010 Ctrl Delay	21.8											
HCM 2010 LOS	C											

I-26 WIDENING (MM 187 – 194) AND I-26/SC 27 INTERCHANGE IMPROVEMENTS










June 2019

D.4 2023 BUILD – ALTERNATIVE 1



HCM 2010 TWSC
1: Jedburg Road & Old Dairy Road

2023 Alt 1 Build Conditions
AM Peak Hour

Intersection												
Int Delay, s/veh	22.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	85	3	37	9	6	88	30	728	19	125	489	94
Future Vol, veh/h	85	3	37	9	6	88	30	728	19	125	489	94
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Yield	-	-	None	-	-	None
Storage Length	0	-	250	150	-	150	150	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	34	34	34	34	34	34	11	11	11	11	11	11
Mvmt Flow	89	3	39	9	6	93	32	766	20	132	515	99

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1279	1679	307	1363	1718	393	614	0	0	786	0	0
Stage 1	829	829	-	840	840	-	-	-	-	-	-	-
Stage 2	450	850	-	523	878	-	-	-	-	-	-	-
Critical Hdwy	8.18	7.18	7.58	8.18	7.18	7.58	4.32	-	-	4.32	-	-
Critical Hdwy Stg 1	7.18	6.18	-	7.18	6.18	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7.18	6.18	-	7.18	6.18	-	-	-	-	-	-	-
Follow-up Hdwy	3.84	4.34	3.64	3.84	4.34	3.64	2.31	-	-	2.31	-	-
Pot Cap-1 Maneuver	94	68	603	80	64	524	903	-	-	773	-	-
Stage 1	270	316	-	266	312	-	-	-	-	-	-	-
Stage 2	481	308	-	431	298	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 60	54	603	61	51	524	903	-	-	773	-	-
Mov Cap-2 Maneuver	~ 60	54	-	61	51	-	-	-	-	-	-	-
Stage 1	261	262	-	257	301	-	-	-	-	-	-	-
Stage 2	374	297	-	330	247	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	280.6		22.9		0.4		1.9	
HCM LOS	F		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	903	-	-	60	342	61	51	524	773	-	-
HCM Lane V/C Ratio	0.035	-	-	1.491	0.123	0.155	0.124	0.177	0.17	-	-
HCM Control Delay (s)	9.1	-	-	\$ 404.6	17	74.6	85.3	13.3	10.6	-	-
HCM Lane LOS	A	-	-	F	C	F	F	B	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	7.9	0.4	0.5	0.4	0.6	0.6	-	-









Notes											
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon					

HCM 2010 Signalized Intersection Summary

2: Jedburg Road & I-26 EB Ramps

2023 Alt 1 Build Conditions

AM Peak Hour


















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	0	123	0	0	0	0	315	586	278	585	0
Future Volume (veh/h)	22	0	123	0	0	0	0	315	586	278	585	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1473	1473				0	1712	1712	1712	1712	0
Adj Flow Rate, veh/h	23	0	129				0	332	617	293	616	0
Adj No. of Lanes	0	1	1				0	2	1	1	2	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	29	29	29				0	11	11	11	11	0
Cap, veh/h	179	0	160				0	1628	728	527	2275	0
Arrive On Green	0.13	0.00	0.13				0.00	0.50	0.50	0.11	0.70	0.00
Sat Flow, veh/h	1403	0	1252				0	3338	1455	1630	3338	0
Grp Volume(v), veh/h	23	0	129				0	332	617	293	616	0
Grp Sat Flow(s),veh/h/ln	1403	0	1252				0	1626	1455	1630	1626	0
Q Serve(g_s), s	1.0	0.0	7.0				0.0	3.9	25.5	5.4	4.9	0.0
Cycle Q Clear(g_c), s	1.0	0.0	7.0				0.0	3.9	25.5	5.4	4.9	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	179	0	160				0	1628	728	527	2275	0
V/C Ratio(X)	0.13	0.00	0.81				0.00	0.20	0.85	0.56	0.27	0.00
Avail Cap(c_a), veh/h	323	0	289				0	2062	922	626	2905	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	26.9	0.0	29.5				0.0	9.6	15.0	6.0	3.9	0.0
Incr Delay (d2), s/veh	0.3	0.0	9.3				0.0	0.1	6.0	0.9	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	2.8				0.0	1.8	11.3	2.5	2.2	0.0
LnGrp Delay(d),s/veh	27.2	0.0	38.7				0.0	9.7	21.1	6.9	3.9	0.0
LnGrp LOS	C		D					A	C	A	A	
Approach Vol, veh/h		152						949			909	
Approach Delay, s/veh		37.0						17.1			4.9	
Approach LOS		D						B			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	13.8	40.8		14.8		54.6						
Change Period (Y+Rc), s	6.0	6.0		6.0		6.0						
Max Green Setting (Gmax), s	12.0	44.0		16.0		62.0						
Max Q Clear Time (g_c+I1), s	7.4	27.5		9.0		6.9						
Green Ext Time (p_c), s	0.4	7.2		0.4		17.8						
Intersection Summary												
HCM 2010 Ctrl Delay			13.1									
HCM 2010 LOS			B									

HCM 2010 Signalized Intersection Summary

3: Jedburg Road & I-26 WB Ramps










2023 Alt 1 Build Conditions

AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	0	152	66	271	0	0	547	85
Future Volume (veh/h)	0	0	0	0	0	152	66	271	0	0	547	85
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				0	0	1727	1712	1712	0	0	1712	1712
Adj Flow Rate, veh/h				0	0	160	69	285	0	0	576	0
Adj No. of Lanes				0	0	1	1	2	0	0	2	1
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				0	0	10	11	11	0	0	11	11
Cap, veh/h				0	0	0	685	2660	0	0	1883	842
Arrive On Green				0.00	0.00	0.00	0.06	0.82	0.00	0.00	0.58	0.00
Sat Flow, veh/h					0		1630	3338	0	0	3338	1455
Grp Volume(v), veh/h					0.0		69	285	0	0	576	0
Grp Sat Flow(s),veh/h/ln							1630	1626	0	0	1626	1455
Q Serve(g_s), s							0.4	0.6	0.0	0.0	3.0	0.0
Cycle Q Clear(g_c), s							0.4	0.6	0.0	0.0	3.0	0.0
Prop In Lane							1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h							685	2660	0	0	1883	842
V/C Ratio(X)							0.10	0.11	0.00	0.00	0.31	0.00
Avail Cap(c_a), veh/h							1285	6121	0	0	4146	1855
HCM Platoon Ratio							1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)							1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh							2.0	0.6	0.0	0.0	3.5	0.0
Incr Delay (d2), s/veh							0.1	0.0	0.0	0.0	0.1	0.0
Initial Q Delay(d3),s/veh							0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln							0.2	0.2	0.0	0.0	1.3	0.0
LnGrp Delay(d),s/veh							2.1	0.6	0.0	0.0	3.6	0.0
LnGrp LOS							A	A			A	
Approach Vol, veh/h								354			576	
Approach Delay, s/veh								0.9			3.6	
Approach LOS								A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6						
Phs Duration (G+Y+Rc), s		32.9			7.9	25.1						
Change Period (Y+Rc), s		6.0			6.0	6.0						
Max Green Setting (Gmax), s		62.0			14.0	42.0						
Max Q Clear Time (g_c+I1), s		2.6			2.4	5.0						
Green Ext Time (p_c), s		7.2			0.1	14.1						
Intersection Summary												
HCM 2010 Ctrl Delay				2.6								
HCM 2010 LOS				A								

HCM 2010 TWSC
4: Jedburg Road & Drop Off Drive




2023 Alt 1 Build Conditions
AM Peak Hour




Intersection												
Int Delay, s/veh	4.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	33	9	94	49	14	14	55	305	63	18	489	55
Future Vol, veh/h	33	9	94	49	14	14	55	305	63	18	489	55
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	175	-	-	200	-	200	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	22	22	22	22	22	22	11	11	11	11	11	11
Mvmt Flow	35	10	100	52	15	15	59	324	67	19	520	59

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	876	1097	290	745	1059	162	579	0	0	391	0	0
Stage 1	588	588	-	442	442	-	-	-	-	-	-	-
Stage 2	288	509	-	303	617	-	-	-	-	-	-	-
Critical Hdwy	7.94	6.94	7.34	7.94	6.94	7.34	4.32	-	-	4.32	-	-
Critical Hdwy Stg 1	6.94	5.94	-	6.94	5.94	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.94	5.94	-	6.94	5.94	-	-	-	-	-	-	-
Follow-up Hdwy	3.72	4.22	3.52	3.72	4.22	3.52	2.31	-	-	2.31	-	-
Pot Cap-1 Maneuver	213	183	650	268	193	795	931	-	-	1102	-	-
Stage 1	416	447	-	514	527	-	-	-	-	-	-	-
Stage 2	642	489	-	628	433	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	184	169	650	204	178	795	931	-	-	1102	-	-
Mov Cap-2 Maneuver	184	169	-	204	178	-	-	-	-	-	-	-
Stage 1	390	439	-	482	494	-	-	-	-	-	-	-
Stage 2	572	458	-	511	426	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	17.4		25		1.2		0.3	
HCM LOS	C		D					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	931	-	-	184	521	204	291	1102	-	-
HCM Lane V/C Ratio	0.063	-	-	0.191	0.21	0.256	0.102	0.017	-	-
HCM Control Delay (s)	9.1	-	-	29.1	13.7	28.6	18.8	8.3	-	-
HCM Lane LOS	A	-	-	D	B	D	C	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.7	0.8	1	0.3	0.1	-	-

Intersection						
Int Delay, s/veh	0					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	0	415	1	0	379
Future Vol, veh/h	2	0	415	1	0	379
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	16	16	16	16
Mvmt Flow	2	0	461	1	0	421
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	673	231	0	0	462	0
Stage 1	462	-	-	-	-	-
Stage 2	211	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.42	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.36	-
Pot Cap-1 Maneuver	389	771	-	-	1003	-
Stage 1	601	-	-	-	-	-
Stage 2	804	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	389	771	-	-	1003	-
Mov Cap-2 Maneuver	389	-	-	-	-	-
Stage 1	601	-	-	-	-	-
Stage 2	804	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	14.3	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	- 389		1003	-	
HCM Lane V/C Ratio	-	- 0.006		-	-	
HCM Control Delay (s)	-	- 14.3		0	-	
HCM Lane LOS	-	- B		A	-	
HCM 95th %tile Q(veh)	-	- 0		0	-	

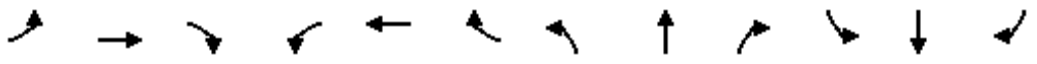
Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	1	0	415	378	3
Future Vol, veh/h	1	1	0	415	378	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	50	50	16	16	16	16
Mvmt Flow	1	1	0	456	415	3
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	645	209	418	0	-	0
Stage 1	417	-	-	-	-	-
Stage 2	228	-	-	-	-	-
Critical Hdwy	7.8	7.9	4.42	-	-	-
Critical Hdwy Stg 1	6.8	-	-	-	-	-
Critical Hdwy Stg 2	6.8	-	-	-	-	-
Follow-up Hdwy	4	3.8	2.36	-	-	-
Pot Cap-1 Maneuver	312	667	1044	-	-	-
Stage 1	512	-	-	-	-	-
Stage 2	662	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	312	667	1044	-	-	-
Mov Cap-2 Maneuver	312	-	-	-	-	-
Stage 1	512	-	-	-	-	-
Stage 2	662	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	13.5	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1044	-	425	-	-	
HCM Lane V/C Ratio	-	-	0.005	-	-	
HCM Control Delay (s)	0	-	13.5	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	

HCM 2010 Signalized Intersection Summary

7: SC 27 & I-26 WB Ramp

2023 Alt 1 Build Conditions

AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↰	↱	↰	↱			↱	↰
Traffic Volume (veh/h)	0	0	0	172	2	202	95	213	0	0	359	20
Future Volume (veh/h)	0	0	0	172	2	202	95	213	0	0	359	20
Number				7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1900	1520	1520	1638	1638	0	0	1638	1900
Adj Flow Rate, veh/h				183	2	0	101	227	0	0	382	0
Adj No. of Lanes				0	1	1	1	2	0	0	2	0
Peak Hour Factor				0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %				25	25	25	16	16	0	0	16	16
Cap, veh/h				277	3	250	439	1532	0	0	828	0
Arrive On Green				0.19	0.19	0.00	0.07	0.49	0.00	0.00	0.27	0.00
Sat Flow, veh/h				1433	16	1292	1560	3194	0	0	3276	0
Grp Volume(v), veh/h				185	0	0	101	227	0	0	382	0
Grp Sat Flow(s),veh/h/ln				1448	0	1292	1560	1556	0	0	1556	0
Q Serve(g_s), s				4.5	0.0	0.0	1.6	1.5	0.0	0.0	3.9	0.0
Cycle Q Clear(g_c), s				4.5	0.0	0.0	1.6	1.5	0.0	0.0	3.9	0.0
Prop In Lane				0.99		1.00	1.00		0.00	0.00		0.00
Lane Grp Cap(c), veh/h				280	0	250	439	1532	0	0	828	0
V/C Ratio(X)				0.66	0.00	0.00	0.23	0.15	0.00	0.00	0.46	0.00
Avail Cap(c_a), veh/h				608	0	542	700	2611	0	0	1387	0
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				14.2	0.0	0.0	8.2	5.3	0.0	0.0	11.7	0.0
Incr Delay (d2), s/veh				2.7	0.0	0.0	0.3	0.0	0.0	0.0	0.4	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				2.0	0.0	0.0	0.7	0.6	0.0	0.0	1.7	0.0
LnGrp Delay(d),s/veh				16.9	0.0	0.0	8.4	5.3	0.0	0.0	12.1	0.0
LnGrp LOS				B			A	A			B	
Approach Vol, veh/h					185			328			382	
Approach Delay, s/veh					16.9			6.3			12.1	
Approach LOS					B			A			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	8.6	16.1		13.4		24.8						
Change Period (Y+Rc), s	6.0	6.0		6.0		6.0						
Max Green Setting (Gmax), s	9.0	17.0		16.0		32.0						
Max Q Clear Time (g_c+I1), s	3.6	5.9		6.5		3.5						
Green Ext Time (p_c), s	0.1	4.2		2.1		4.3						
Intersection Summary												
HCM 2010 Ctrl Delay				11.0								
HCM 2010 LOS				B								




HCM 2010 Signalized Intersection Summary

8: I-26 EB Ramp & SC 27

2023 Alt 1 Build Conditions

AM Peak Hour




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↩	↪					↕		↩	↕	
Traffic Volume (veh/h)	36	0	83	0	0	0	0	272	258	249	282	0
Future Volume (veh/h)	36	0	83	0	0	0	0	272	258	249	282	0
Number	3	8	18				1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1545	1545				0	1638	1900	1638	1638	0
Adj Flow Rate, veh/h	40	0	0				0	299	0	274	310	0
Adj No. of Lanes	0	1	1				0	2	0	1	2	0
Peak Hour Factor	0.91	0.91	0.91				0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	23	23	23				0	16	16	16	16	0
Cap, veh/h	55	0	49				0	758	0	638	1854	0
Arrive On Green	0.04	0.00	0.00				0.00	0.24	0.00	0.17	0.60	0.00
Sat Flow, veh/h	1471	0	1313				0	3276	0	1560	3194	0
Grp Volume(v), veh/h	40	0	0				0	299	0	274	310	0
Grp Sat Flow(s),veh/h/ln	1471	0	1313				0	1556	0	1560	1556	0
Q Serve(g_s), s	0.9	0.0	0.0				0.0	2.6	0.0	3.7	1.5	0.0
Cycle Q Clear(g_c), s	0.9	0.0	0.0				0.0	2.6	0.0	3.7	1.5	0.0
Prop In Lane	1.00		1.00				0.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	55	0	49				0	758	0	638	1854	0
V/C Ratio(X)	0.73	0.00	0.00				0.00	0.39	0.00	0.43	0.17	0.00
Avail Cap(c_a), veh/h	720	0	643				0	1523	0	852	3046	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00				0.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	15.6	0.0	0.0				0.0	10.3	0.0	6.0	3.0	0.0
Incr Delay (d2), s/veh	16.8	0.0	0.0				0.0	0.3	0.0	0.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.0				0.0	1.2	0.0	1.5	0.6	0.0
LnGrp Delay(d),s/veh	32.4	0.0	0.0				0.0	10.7	0.0	6.4	3.0	0.0
LnGrp LOS	C							B		A	A	
Approach Vol, veh/h		40						299			584	
Approach Delay, s/veh		32.4						10.7			4.6	
Approach LOS		C						B			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		25.5			11.5	14.0		7.2				
Change Period (Y+Rc), s		6.0			6.0	6.0		6.0				
Max Green Setting (Gmax), s		32.0			10.0	16.0		16.0				
Max Q Clear Time (g_c+I1), s		3.5			5.7	4.6		2.9				
Green Ext Time (p_c), s		6.0			0.3	3.3		0.3				
Intersection Summary												
HCM 2010 Ctrl Delay			7.8									
HCM 2010 LOS			A									

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	5	525	1	1	362
Future Vol, veh/h	2	5	525	1	1	362
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	16	16	16	16
Mvmt Flow	2	5	577	1	1	398
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	779	289	0	0	578	0
Stage 1	578	-	-	-	-	-
Stage 2	201	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.42	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.36	-
Pot Cap-1 Maneuver	333	708	-	-	901	-
Stage 1	524	-	-	-	-	-
Stage 2	813	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	333	708	-	-	901	-
Mov Cap-2 Maneuver	333	-	-	-	-	-
Stage 1	524	-	-	-	-	-
Stage 2	812	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	11.8	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	536	901	-	
HCM Lane V/C Ratio	-	-	0.014	0.001	-	
HCM Control Delay (s)	-	-	11.8	9	0	
HCM Lane LOS	-	-	B	A	A	
HCM 95th %tile Q(veh)	-	-	0	0	-	

Intersection												
Int Delay, s/veh	2.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	6	26	33	3	16	8	174	39	14	112	1
Future Vol, veh/h	6	6	26	33	3	16	8	174	39	14	112	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	23	23	23	23	23	23	36	36	36	36	36	36
Mvmt Flow	7	7	29	37	3	18	9	193	43	16	124	1
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	400	411	125	408	390	215	125	0	0	236	0	0
Stage 1	157	157	-	233	233	-	-	-	-	-	-	-
Stage 2	243	254	-	175	157	-	-	-	-	-	-	-
Critical Hdwy	7.33	6.73	6.43	7.33	6.73	6.43	4.46	-	-	4.46	-	-
Critical Hdwy Stg 1	6.33	5.73	-	6.33	5.73	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.33	5.73	-	6.33	5.73	-	-	-	-	-	-	-
Follow-up Hdwy	3.707	4.207	3.507	3.707	4.207	3.507	2.524	-	-	2.524	-	-
Pot Cap-1 Maneuver	525	500	872	518	514	775	1276	-	-	1155	-	-
Stage 1	798	730	-	725	675	-	-	-	-	-	-	-
Stage 2	716	660	-	780	730	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	501	489	872	487	502	775	1276	-	-	1155	-	-
Mov Cap-2 Maneuver	501	489	-	487	502	-	-	-	-	-	-	-
Stage 1	792	719	-	719	670	-	-	-	-	-	-	-
Stage 2	691	655	-	736	719	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	10.4		12.3		0.3		0.9					
HCM LOS	B		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1276	-	-	703	551	1155	-	-				
HCM Lane V/C Ratio	0.007	-	-	0.06	0.105	0.013	-	-				
HCM Control Delay (s)	7.8	0	-	10.4	12.3	8.2	0	-				
HCM Lane LOS	A	A	-	B	B	A	A	-				
HCM 95th %tile Q(veh)	0	-	-	0.2	0.3	0	-	-				

























Intersection												
Int Delay, s/veh	4.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕			↕			↕	
Traffic Vol, veh/h	0	0	0	60	2	99	27	122	0	0	146	25
Future Vol, veh/h	0	0	0	60	2	99	27	122	0	0	146	25
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	46	46	46	46	46	46	36	36	36	36	36	36
Mvmt Flow	0	0	0	64	2	105	29	130	0	0	155	27
Major/Minor				Minor1		Major1		Major2				
Conflicting Flow All				357	370	130	182	0	-	-	-	0
Stage 1				188	188	-	-	-	-	-	-	-
Stage 2				169	182	-	-	-	-	-	-	-
Critical Hdwy				6.86	6.96	6.66	4.46	-	-	-	-	-
Critical Hdwy Stg 1				5.86	5.96	-	-	-	-	-	-	-
Critical Hdwy Stg 2				5.86	5.96	-	-	-	-	-	-	-
Follow-up Hdwy				3.914	4.414	3.714	2.524	-	-	-	-	-
Pot Cap-1 Maneuver				562	496	814	1213	-	0	0	-	-
Stage 1				749	669	-	-	-	0	0	-	-
Stage 2				765	673	-	-	-	0	0	-	-
Platoon blocked, %								-			-	-
Mov Cap-1 Maneuver				547	0	814	1213	-	-	-	-	-
Mov Cap-2 Maneuver				547	0	-	-	-	-	-	-	-
Stage 1				730	0	-	-	-	-	-	-	-
Stage 2				765	0	-	-	-	-	-	-	-
Approach				WB		NB		SB				
HCM Control Delay, s				12		1.5		0				
HCM LOS				B								
Minor Lane/Major Mvmt	NBL	NBT	WBLn1	SBT	SBR							
Capacity (veh/h)	1213	-	687	-	-							
HCM Lane V/C Ratio	0.024	-	0.249	-	-							
HCM Control Delay (s)	8	0	12	-	-							
HCM Lane LOS	A	A	B	-	-							
HCM 95th %tile Q(veh)	0.1	-	1	-	-							

Intersection												
Int Delay, s/veh	2.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↗			↖	
Traffic Vol, veh/h	28	2	25	0	0	0	0	121	69	71	135	0
Future Vol, veh/h	28	2	25	0	0	0	0	121	69	71	135	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	53	53	53	53	53	53	36	36	36	36	36	36
Mvmt Flow	31	2	28	0	0	0	0	134	77	79	150	0
Major/Minor	Minor2						Major1		Major2			
Conflicting Flow All	481	519	150				-	0	0	211	0	0
Stage 1	308	308	-				-	-	-	-	-	-
Stage 2	173	211	-				-	-	-	-	-	-
Critical Hdwy	6.93	7.03	6.73				-	-	-	4.46	-	-
Critical Hdwy Stg 1	5.93	6.03	-				-	-	-	-	-	-
Critical Hdwy Stg 2	5.93	6.03	-				-	-	-	-	-	-
Follow-up Hdwy	3.977	4.477	3.777				-	-	-	2.524	-	-
Pot Cap-1 Maneuver	462	396	778				0	-	-	1181	-	0
Stage 1	643	578	-				0	-	-	-	-	0
Stage 2	748	642	-				0	-	-	-	-	0
Platoon blocked, %								-	-	-		
Mov Cap-1 Maneuver	428	0	778				-	-	-	1181	-	-
Mov Cap-2 Maneuver	428	0	-				-	-	-	-	-	-
Stage 1	643	0	-				-	-	-	-	-	-
Stage 2	693	0	-				-	-	-	-	-	-
Approach	EB						NB		SB			
HCM Control Delay, s	12.5						0		2.8			
HCM LOS	B											
Minor Lane/Major Mvmt		NBT	NBR	EBLn1	SBL	SBT						
Capacity (veh/h)		-	-	543	1181	-						
HCM Lane V/C Ratio		-	-	0.113	0.067	-						
HCM Control Delay (s)		-	-	12.5	8.3	0						
HCM Lane LOS		-	-	B	A	A						
HCM 95th %tile Q(veh)		-	-	0.4	0.2	-						

Intersection						
Int Delay, s/veh	5.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	68	84	56	122	112	47
Future Vol, veh/h	68	84	56	122	112	47
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	19	19	36	36	36	36
Mvmt Flow	75	92	62	134	123	52
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	196	0	-	0	371	129
Stage 1	-	-	-	-	129	-
Stage 2	-	-	-	-	242	-
Critical Hdwy	4.29	-	-	-	6.76	6.56
Critical Hdwy Stg 1	-	-	-	-	5.76	-
Critical Hdwy Stg 2	-	-	-	-	5.76	-
Follow-up Hdwy	2.371	-	-	-	3.824	3.624
Pot Cap-1 Maneuver	1281	-	-	-	568	837
Stage 1	-	-	-	-	820	-
Stage 2	-	-	-	-	725	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1281	-	-	-	533	837
Mov Cap-2 Maneuver	-	-	-	-	533	-
Stage 1	-	-	-	-	769	-
Stage 2	-	-	-	-	725	-
Approach	EB	WB		SB		
HCM Control Delay, s	3.6	0		13.5		
HCM LOS				B		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1281	-	-	-	597	
HCM Lane V/C Ratio	0.058	-	-	-	0.293	
HCM Control Delay (s)	8	0	-	-	13.5	
HCM Lane LOS	A	A	-	-	B	
HCM 95th %tile Q(veh)	0.2	-	-	-	1.2	










HCM 2010 Signalized Intersection Summary
15: Volvo Car Drive & Welcome Center/Factory Entrance

2023 Alt 1 Build Conditions
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	0	11	24	0	11	76	197	219	72	77	26
Future Volume (veh/h)	3	0	11	24	0	11	76	197	219	72	77	26
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727
Adj Flow Rate, veh/h	3	0	12	26	0	12	83	214	238	78	84	28
Adj No. of Lanes	1	1	1	1	1	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	10	10	10	10	10	10	10	10	10	10	10	10
Cap, veh/h	226	45	38	263	83	70	555	458	390	424	454	386
Arrive On Green	0.00	0.00	0.03	0.03	0.00	0.05	0.06	0.27	0.27	0.06	0.26	0.26
Sat Flow, veh/h	1645	1727	1468	1645	1727	1468	1645	1727	1468	1645	1727	1468
Grp Volume(v), veh/h	3	0	12	26	0	12	83	214	238	78	84	28
Grp Sat Flow(s),veh/h/ln	1645	1727	1468	1645	1727	1468	1645	1727	1468	1645	1727	1468
Q Serve(g_s), s	0.1	0.0	0.3	0.6	0.0	0.3	1.4	4.0	5.5	1.3	1.4	0.6
Cycle Q Clear(g_c), s	0.1	0.0	0.3	0.6	0.0	0.3	1.4	4.0	5.5	1.3	1.4	0.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	226	45	38	263	83	70	555	458	390	424	454	386
V/C Ratio(X)	0.01	0.00	0.31	0.10	0.00	0.17	0.15	0.47	0.61	0.18	0.18	0.07
Avail Cap(c_a), veh/h	606	719	611	606	719	611	839	764	649	713	764	649
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.1	0.0	18.4	17.6	0.0	17.6	9.3	11.8	12.4	9.5	11.0	10.6
Incr Delay (d2), s/veh	0.0	0.0	4.6	0.2	0.0	1.1	0.1	0.7	1.6	0.2	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.2	0.3	0.0	0.1	0.6	2.0	2.4	0.6	0.7	0.2
LnGrp Delay(d),s/veh	18.2	0.0	23.0	17.7	0.0	18.7	9.4	12.6	13.9	9.7	11.2	10.7
LnGrp LOS	B		C	B		B	A	B	B	A	B	B
Approach Vol, veh/h	15		38				535				190	
Approach Delay, s/veh	22.0		18.0				12.7				10.5	
Approach LOS	C		B				B				B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.4	16.1	6.1	7.8	8.3	16.2	7.0	7.0				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	9.0	17.0	9.0	16.0	9.0	17.0	9.0	16.0				
Max Q Clear Time (g_c+I1), s	3.4	3.4	2.1	2.3	3.3	7.5	2.6	2.3				
Green Ext Time (p_c), s	0.1	0.9	0.0	0.0	0.1	2.7	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay	12.6											
HCM 2010 LOS	B											

HCM 2010 TWSC
1: Jedburg Road & Old Dairy Road

2023 Alt 1 Build Conditions
PM Peak Hour

Intersection												
Int Delay, s/veh	29.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	69	8	56	11	11	160	29	633	24	103	769	115
Future Vol, veh/h	69	8	56	11	11	160	29	633	24	103	769	115
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Yield	-	-	None	-	-	None
Storage Length	0	-	250	150	-	150	150	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	9	9	9	9	9	9	7	7	7	7	7	7
Mvmt Flow	76	9	62	12	12	176	32	696	26	113	845	126

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1552	1920	486	1426	1970	361	971	0	0	722	0	0
Stage 1	1134	1134	-	773	773	-	-	-	-	-	-	-
Stage 2	418	786	-	653	1197	-	-	-	-	-	-	-
Critical Hdwy	7.68	6.68	7.08	7.68	6.68	7.08	4.24	-	-	4.24	-	-
Critical Hdwy Stg 1	6.68	5.68	-	6.68	5.68	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.68	5.68	-	6.68	5.68	-	-	-	-	-	-	-
Follow-up Hdwy	3.59	4.09	3.39	3.59	4.09	3.39	2.27	-	-	2.27	-	-
Pot Cap-1 Maneuver	~ 72	61	509	90	57	616	676	-	-	844	-	-
Stage 1	204	262	-	343	391	-	-	-	-	-	-	-
Stage 2	565	385	-	406	244	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 36	50	509	59	47	616	676	-	-	844	-	-
Mov Cap-2 Maneuver	~ 36	50	-	59	47	-	-	-	-	-	-	-
Stage 1	194	227	-	327	373	-	-	-	-	-	-	-
Stage 2	372	367	-	297	211	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s\$	401.7		22.9		0.4		1	
HCM LOS	F		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	676	-	-	36	237	59	47	616	844	-	-
HCM Lane V/C Ratio	0.047	-	-	2.106	0.297	0.205	0.257	0.285	0.134	-	-
HCM Control Delay (s)	10.6	-	-	\$ 749.8	26.5	81.1	106.3	13.2	9.9	-	-
HCM Lane LOS	B	-	-	F	D	F	F	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	8.4	1.2	0.7	0.9	1.2	0.5	-	-

Notes												
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon						

HCM 2010 Signalized Intersection Summary

2: Jedburg Road & I-26 EB Ramps

2023 Alt 1 Build Conditions


















PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↩	↩					↩↩	↩	↩	↩↩	
Traffic Volume (veh/h)	58	2	98	0	0	0	0	372	490	152	889	0
Future Volume (veh/h)	58	2	98	0	0	0	0	372	490	152	889	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1597	1597				0	1776	1776	1776	1776	0
Adj Flow Rate, veh/h	61	2	103				0	392	516	160	936	0
Adj No. of Lanes	0	1	1				0	2	1	1	2	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	19	19	19				0	7	7	7	7	0
Cap, veh/h	171	6	158				0	1655	740	501	2265	0
Arrive On Green	0.12	0.12	0.12				0.00	0.49	0.49	0.07	0.67	0.00
Sat Flow, veh/h	1475	48	1357				0	3463	1509	1691	3463	0
Grp Volume(v), veh/h	63	0	103				0	392	516	160	936	0
Grp Sat Flow(s),veh/h/ln	1523	0	1357				0	1687	1509	1691	1687	0
Q Serve(g_s), s	2.2	0.0	4.1				0.0	3.8	14.9	2.4	7.1	0.0
Cycle Q Clear(g_c), s	2.2	0.0	4.1				0.0	3.8	14.9	2.4	7.1	0.0
Prop In Lane	0.97		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	177	0	158				0	1655	740	501	2265	0
V/C Ratio(X)	0.36	0.00	0.65				0.00	0.24	0.70	0.32	0.41	0.00
Avail Cap(c_a), veh/h	486	0	433				0	2571	1150	704	3588	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	23.0	0.0	23.9				0.0	8.3	11.1	5.4	4.2	0.0
Incr Delay (d2), s/veh	1.2	0.0	4.5				0.0	0.1	1.2	0.4	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	1.7				0.0	1.8	6.4	1.1	3.3	0.0
LnGrp Delay(d),s/veh	24.2	0.0	28.4				0.0	8.4	12.3	5.7	4.3	0.0
LnGrp LOS	C		C					A	B	A	A	
Approach Vol, veh/h		166						908			1096	
Approach Delay, s/veh		26.8						10.6			4.5	
Approach LOS		C						B			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	10.2	33.7		12.5		43.9						
Change Period (Y+Rc), s	6.0	6.0		6.0		6.0						
Max Green Setting (Gmax), s	11.0	43.0		18.0		60.0						
Max Q Clear Time (g_c+I1), s	4.4	16.9		6.1		9.1						
Green Ext Time (p_c), s	0.2	9.7		1.0		28.8						
Intersection Summary												
HCM 2010 Ctrl Delay			8.8									
HCM 2010 LOS			A									

HCM 2010 Signalized Intersection Summary

3: Jedburg Road & I-26 WB Ramps

2023 Alt 1 Build Conditions
PM Peak Hour

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	0	277	84	346	0	0	414	71
Future Volume (veh/h)	0	0	0	0	0	277	84	346	0	0	414	71
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				0	0	1792	1776	1776	0	0	1776	1776
Adj Flow Rate, veh/h				0	0	292	88	364	0	0	436	0
Adj No. of Lanes				0	0	1	1	2	0	0	2	1
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				0	0	6	7	7	0	0	7	7
Cap, veh/h				0	0	0	757	2627	0	0	1638	733
Arrive On Green				0.00	0.00	0.00	0.07	0.78	0.00	0.00	0.49	0.00
Sat Flow, veh/h					0		1691	3463	0	0	3463	1509
Grp Volume(v), veh/h					0.0		88	364	0	0	436	0
Grp Sat Flow(s),veh/h/ln							1691	1687	0	0	1687	1509
Q Serve(g_s), s							0.5	0.7	0.0	0.0	2.1	0.0
Cycle Q Clear(g_c), s							0.5	0.7	0.0	0.0	2.1	0.0
Prop In Lane							1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h							757	2627	0	0	1638	733
V/C Ratio(X)							0.12	0.14	0.00	0.00	0.27	0.00
Avail Cap(c_a), veh/h							1447	6352	0	0	3985	1783
HCM Platoon Ratio							1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)							1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh							2.3	0.7	0.0	0.0	4.1	0.0
Incr Delay (d2), s/veh							0.1	0.0	0.0	0.0	0.1	0.0
Initial Q Delay(d3),s/veh							0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln							0.2	0.3	0.0	0.0	0.9	0.0
LnGrp Delay(d),s/veh							2.4	0.8	0.0	0.0	4.2	0.0
LnGrp LOS							A	A			A	
Approach Vol, veh/h								452			436	
Approach Delay, s/veh								1.1			4.2	
Approach LOS								A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6						
Phs Duration (G+Y+Rc), s		27.1			7.9	19.2						
Change Period (Y+Rc), s		6.0			6.0	6.0						
Max Green Setting (Gmax), s		51.0			13.0	32.0						
Max Q Clear Time (g_c+I1), s		2.7			2.5	4.1						
Green Ext Time (p_c), s		9.1			0.1	9.1						
Intersection Summary												
HCM 2010 Ctrl Delay				2.6								
HCM 2010 LOS				A								

HCM 2010 TWSC
4: Jedburg Road & Drop Off Drive




2023 Alt 1 Build Conditions
PM Peak Hour




Intersection												
Int Delay, s/veh	4.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↰↱		↰	↰		↰	↰↱	↰	↰	↰↱	
Traffic Vol, veh/h	28	8	82	69	8	26	71	507	45	14	334	59
Future Vol, veh/h	28	8	82	69	8	26	71	507	45	14	334	59
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	175	-	-	200	-	200	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	8	8	8	8	8	8	7	7	7	7	7	7
Mvmt Flow	30	9	88	74	9	28	76	545	48	15	359	63

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	850	1166	211	911	1149	273	422	0	0	593	0	0
Stage 1	421	421	-	697	697	-	-	-	-	-	-	-
Stage 2	429	745	-	214	452	-	-	-	-	-	-	-
Critical Hdwy	7.66	6.66	7.06	7.66	6.66	7.06	4.24	-	-	4.24	-	-
Critical Hdwy Stg 1	6.66	5.66	-	6.66	5.66	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.66	5.66	-	6.66	5.66	-	-	-	-	-	-	-
Follow-up Hdwy	3.58	4.08	3.38	3.58	4.08	3.38	2.27	-	-	2.27	-	-
Pot Cap-1 Maneuver	244	184	776	220	188	707	1099	-	-	945	-	-
Stage 1	565	572	-	384	427	-	-	-	-	-	-	-
Stage 2	559	405	-	751	554	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	211	169	776	176	172	707	1099	-	-	945	-	-
Mov Cap-2 Maneuver	211	169	-	176	172	-	-	-	-	-	-	-
Stage 1	526	563	-	358	398	-	-	-	-	-	-	-
Stage 2	489	377	-	645	545	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	15.1		31.4		1		0.3	
HCM LOS	C		D					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1099	-	-	211	169	665	176	408	945	-	-
HCM Lane V/C Ratio	0.069	-	-	0.143	0.025	0.139	0.422	0.09	0.016	-	-
HCM Control Delay (s)	8.5	-	-	24.9	26.9	11.3	39.6	14.7	8.9	-	-
HCM Lane LOS	A	-	-	C	D	B	E	B	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.5	0.1	0.5	1.9	0.3	0	-	-

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	7	1	451	4	2	579
Future Vol, veh/h	7	1	451	4	2	579
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	7	7	7	7
Mvmt Flow	8	1	501	4	2	643
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	829	253	0	0	505	0
Stage 1	503	-	-	-	-	-
Stage 2	326	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.24	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.27	-
Pot Cap-1 Maneuver	309	746	-	-	1022	-
Stage 1	573	-	-	-	-	-
Stage 2	704	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	308	746	-	-	1022	-
Mov Cap-2 Maneuver	308	-	-	-	-	-
Stage 1	573	-	-	-	-	-
Stage 2	702	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	16.1	0		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	332	1022	-	
HCM Lane V/C Ratio	-	-	0.027	0.002	-	
HCM Control Delay (s)	-	-	16.1	8.5	0	
HCM Lane LOS	-	-	C	A	A	
HCM 95th %tile Q(veh)	-	-	0.1	0	-	

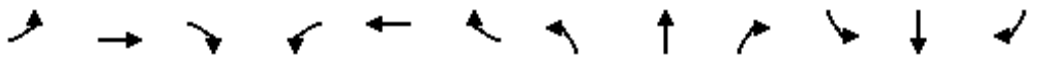
Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	1	0	454	584	2
Future Vol, veh/h	1	1	0	454	584	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	50	50	7	7	7	7
Mvmt Flow	1	1	0	504	649	2
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	902	326	651	0	-	0
Stage 1	650	-	-	-	-	-
Stage 2	252	-	-	-	-	-
Critical Hdwy	7.8	7.9	4.24	-	-	-
Critical Hdwy Stg 1	6.8	-	-	-	-	-
Critical Hdwy Stg 2	6.8	-	-	-	-	-
Follow-up Hdwy	4	3.8	2.27	-	-	-
Pot Cap-1 Maneuver	202	548	898	-	-	-
Stage 1	370	-	-	-	-	-
Stage 2	641	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	202	548	898	-	-	-
Mov Cap-2 Maneuver	202	-	-	-	-	-
Stage 1	370	-	-	-	-	-
Stage 2	641	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	17.3	0		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	898	-	295	-	-	
HCM Lane V/C Ratio	-	-	0.008	-	-	
HCM Control Delay (s)	0	-	17.3	-	-	
HCM Lane LOS	A	-	C	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	

HCM 2010 Signalized Intersection Summary

7: SC 27 & I-26 WB Ramp

2023 Alt 1 Build Conditions

PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↰	↱	↰	↱			↱	↰
Traffic Volume (veh/h)	0	0	0	219	2	287	90	167	0	0	522	63
Future Volume (veh/h)	0	0	0	219	2	287	90	167	0	0	522	63
Number				7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1900	1776	1776	1776	1776	0	0	1776	1900
Adj Flow Rate, veh/h				243	2	0	100	186	0	0	580	0
Adj No. of Lanes				0	1	1	1	2	0	0	2	0
Peak Hour Factor				0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %				7	7	7	7	7	0	0	7	7
Cap, veh/h				374	3	336	399	1703	0	0	1027	0
Arrive On Green				0.22	0.22	0.00	0.06	0.50	0.00	0.00	0.30	0.00
Sat Flow, veh/h				1678	14	1509	1691	3463	0	0	3551	0
Grp Volume(v), veh/h				245	0	0	100	186	0	0	580	0
Grp Sat Flow(s),veh/h/ln				1692	0	1509	1691	1687	0	0	1687	0
Q Serve(g_s), s				5.8	0.0	0.0	1.6	1.3	0.0	0.0	6.4	0.0
Cycle Q Clear(g_c), s				5.8	0.0	0.0	1.6	1.3	0.0	0.0	6.4	0.0
Prop In Lane				0.99		1.00	1.00		0.00	0.00		0.00
Lane Grp Cap(c), veh/h				377	0	336	399	1703	0	0	1027	0
V/C Ratio(X)				0.65	0.00	0.00	0.25	0.11	0.00	0.00	0.56	0.00
Avail Cap(c_a), veh/h				615	0	548	636	2452	0	0	1302	0
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				15.6	0.0	0.0	8.9	5.7	0.0	0.0	12.9	0.0
Incr Delay (d2), s/veh				1.9	0.0	0.0	0.3	0.0	0.0	0.0	0.5	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				2.9	0.0	0.0	0.8	0.6	0.0	0.0	3.0	0.0
LnGrp Delay(d),s/veh				17.5	0.0	0.0	9.3	5.7	0.0	0.0	13.4	0.0
LnGrp LOS				B			A	A			B	
Approach Vol, veh/h					245			286			580	
Approach Delay, s/veh					17.5			7.0			13.4	
Approach LOS					B			A			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	8.8	19.4		15.8		28.2						
Change Period (Y+Rc), s	6.0	6.0		6.0		6.0						
Max Green Setting (Gmax), s	9.0	17.0		16.0		32.0						
Max Q Clear Time (g_c+I1), s	3.6	8.4		7.8		3.3						
Green Ext Time (p_c), s	0.1	5.1		2.5		3.4						
Intersection Summary												
HCM 2010 Ctrl Delay				12.6								
HCM 2010 LOS				B								




HCM 2010 Signalized Intersection Summary





8: I-26 EB Ramp & SC 27




2023 Alt 1 Build Conditions

PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↩	↪					↩↪		↩	↩↪	
Traffic Volume (veh/h)	23	0	112	0	0	0	0	234	176	343	398	0
Future Volume (veh/h)	23	0	112	0	0	0	0	234	176	343	398	0
Number	3	8	18				1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1759	1759				0	1776	1900	1776	1776	0
Adj Flow Rate, veh/h	26	0	0				0	260	0	381	442	0
Adj No. of Lanes	0	1	1				0	2	0	1	2	0
Peak Hour Factor	0.90	0.90	0.90				0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	8	8	8				0	7	7	7	7	0
Cap, veh/h	43	0	38				0	725	0	739	2062	0
Arrive On Green	0.03	0.00	0.00				0.00	0.21	0.00	0.21	0.61	0.00
Sat Flow, veh/h	1675	0	1495				0	3551	0	1691	3463	0
Grp Volume(v), veh/h	26	0	0				0	260	0	381	442	0
Grp Sat Flow(s), veh/h/ln	1675	0	1495				0	1687	0	1691	1687	0
Q Serve(g_s), s	0.5	0.0	0.0				0.0	2.2	0.0	4.9	1.9	0.0
Cycle Q Clear(g_c), s	0.5	0.0	0.0				0.0	2.2	0.0	4.9	1.9	0.0
Prop In Lane	1.00		1.00				0.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	43	0	38				0	725	0	739	2062	0
V/C Ratio(X)	0.60	0.00	0.00				0.00	0.36	0.00	0.52	0.21	0.00
Avail Cap(c_a), veh/h	811	0	724				0	1634	0	889	3268	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00				0.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	15.9	0.0	0.0				0.0	11.0	0.0	6.0	2.9	0.0
Incr Delay (d2), s/veh	12.8	0.0	0.0				0.0	0.3	0.0	0.6	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0				0.0	1.0	0.0	2.2	0.9	0.0
LnGrp Delay(d),s/veh	28.8	0.0	0.0				0.0	11.3	0.0	6.5	2.9	0.0
LnGrp LOS	C							B		A	A	
Approach Vol, veh/h		26						260			823	
Approach Delay, s/veh		28.8						11.3			4.6	
Approach LOS		C						B			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		26.2			13.1	13.1		6.8				
Change Period (Y+Rc), s		6.0			6.0	6.0		6.0				
Max Green Setting (Gmax), s		32.0			10.0	16.0		16.0				
Max Q Clear Time (g_c+I1), s		3.9			6.9	4.2		2.5				
Green Ext Time (p_c), s		8.8			0.4	2.9		0.2				
Intersection Summary												
HCM 2010 Ctrl Delay			6.7									
HCM 2010 LOS			A									

Intersection						
Int Delay, s/veh	0.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	4	4	406	8	9	500
Future Vol, veh/h	4	4	406	8	9	500
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	7	7	7	7
Mvmt Flow	4	4	432	9	10	532
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	723	221	0	0	441	0
Stage 1	437	-	-	-	-	-
Stage 2	286	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.24	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.27	-
Pot Cap-1 Maneuver	361	783	-	-	1081	-
Stage 1	619	-	-	-	-	-
Stage 2	737	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	356	783	-	-	1081	-
Mov Cap-2 Maneuver	356	-	-	-	-	-
Stage 1	619	-	-	-	-	-
Stage 2	727	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	12.5	0		0.2		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	489	1081	-	
HCM Lane V/C Ratio	-	-	0.017	0.009	-	
HCM Control Delay (s)	-	-	12.5	8.4	0.1	
HCM Lane LOS	-	-	B	A	A	
HCM 95th %tile Q(veh)	-	-	0.1	0	-	

Intersection												
Int Delay, s/veh	4.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	2	23	106	9	18	21	132	30	18	149	13
Future Vol, veh/h	6	2	23	106	9	18	21	132	30	18	149	13
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	8	8	8	8	8	8	24	24	24	24	24	24
Mvmt Flow	7	2	25	116	10	20	23	145	33	20	164	14
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	434	435	171	433	426	162	178	0	0	178	0	0
Stage 1	211	211	-	208	208	-	-	-	-	-	-	-
Stage 2	223	224	-	225	218	-	-	-	-	-	-	-
Critical Hdwy	7.18	6.58	6.28	7.18	6.58	6.28	4.34	-	-	4.34	-	-
Critical Hdwy Stg 1	6.18	5.58	-	6.18	5.58	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.18	5.58	-	6.18	5.58	-	-	-	-	-	-	-
Follow-up Hdwy	3.572	4.072	3.372	3.572	4.072	3.372	2.416	-	-	2.416	-	-
Pot Cap-1 Maneuver	522	505	857	523	511	867	1276	-	-	1276	-	-
Stage 1	778	717	-	780	719	-	-	-	-	-	-	-
Stage 2	766	707	-	764	712	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	488	486	857	492	492	867	1276	-	-	1276	-	-
Mov Cap-2 Maneuver	488	486	-	492	492	-	-	-	-	-	-	-
Stage 1	762	705	-	764	705	-	-	-	-	-	-	-
Stage 2	723	693	-	727	700	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	10.3		14.5		0.9		0.8					
HCM LOS	B		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1276	-	-	717	523	1276	-	-				
HCM Lane V/C Ratio	0.018	-	-	0.048	0.279	0.016	-	-				
HCM Control Delay (s)	7.9	0	-	10.3	14.5	7.9	0	-				
HCM Lane LOS	A	A	-	B	B	A	A	-				
HCM 95th %tile Q(veh)	0.1	-	-	0.1	1.1	0	-	-				




Intersection												
Int Delay, s/veh	4.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	80	0	86	28	97	0	0	249	29
Future Vol, veh/h	0	0	0	80	0	86	28	97	0	0	249	29
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	21	21	21	21	21	21	24	24	24	24	24	24
Mvmt Flow	0	0	0	89	0	96	31	108	0	0	277	32
Major/Minor				Minor1		Major1		Major2				
Conflicting Flow All				463	479	108	309	0	-	-	-	0
Stage 1				170	170	-	-	-	-	-	-	-
Stage 2				293	309	-	-	-	-	-	-	-
Critical Hdwy				6.61	6.71	6.41	4.34	-	-	-	-	-
Critical Hdwy Stg 1				5.61	5.71	-	-	-	-	-	-	-
Critical Hdwy Stg 2				5.61	5.71	-	-	-	-	-	-	-
Follow-up Hdwy				3.689	4.189	3.489	2.416	-	-	-	-	-
Pot Cap-1 Maneuver				524	459	897	1137	-	0	0	-	-
Stage 1				816	723	-	-	-	0	0	-	-
Stage 2				716	627	-	-	-	0	0	-	-
Platoon blocked, %								-			-	-
Mov Cap-1 Maneuver				509	0	897	1137	-	-	-	-	-
Mov Cap-2 Maneuver				509	0	-	-	-	-	-	-	-
Stage 1				792	0	-	-	-	-	-	-	-
Stage 2				716	0	-	-	-	-	-	-	-
Approach				WB		NB		SB				
HCM Control Delay, s				12.6		1.8		0				
HCM LOS				B								
Minor Lane/Major Mvmt	NBL	NBTWBLn1		SBT	SBR							
Capacity (veh/h)	1137	-	656	-	-							
HCM Lane V/C Ratio	0.027	-	0.281	-	-							
HCM Control Delay (s)	8.3	0	12.6	-	-							
HCM Lane LOS	A	A	B	-	-							
HCM 95th %tile Q(veh)	0.1	-	1.2	-	-							

Intersection												
Int Delay, s/veh	2.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Traffic Vol, veh/h	11	0	20	0	0	0	0	114	56	107	222	0
Future Vol, veh/h	11	0	20	0	0	0	0	114	56	107	222	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	52	52	52	52	52	52	24	24	24	24	24	24
Mvmt Flow	12	0	22	0	0	0	0	127	62	119	247	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	643	674	247	-	0	0	189	0	0
Stage 1	485	485	-	-	-	-	-	-	-
Stage 2	158	189	-	-	-	-	-	-	-
Critical Hdwy	6.92	7.02	6.72	-	-	-	4.34	-	-
Critical Hdwy Stg 1	5.92	6.02	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.92	6.02	-	-	-	-	-	-	-
Follow-up Hdwy	3.968	4.468	3.768	-	-	-	2.416	-	-
Pot Cap-1 Maneuver	368	319	684	0	-	-	1263	-	0
Stage 1	528	477	-	0	-	-	-	-	0
Stage 2	762	659	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	328	0	684	-	-	-	1263	-	-
Mov Cap-2 Maneuver	328	0	-	-	-	-	-	-	-
Stage 1	528	0	-	-	-	-	-	-	-
Stage 2	679	0	-	-	-	-	-	-	-

























Approach	EB	NB	SB
HCM Control Delay, s	12.8	0	2.6
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	SBL	SBT
Capacity (veh/h)	-	-	494	1263	-
HCM Lane V/C Ratio	-	-	0.07	0.094	-
HCM Control Delay (s)	-	-	12.8	8.1	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0.3	-

Intersection						
Int Delay, s/veh	6.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	36	89	123	134	176	67
Future Vol, veh/h	36	89	123	134	176	67
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	6	6	24	24	24	24
Mvmt Flow	40	99	137	149	196	74
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	286	0	-	0	391	212
Stage 1	-	-	-	-	212	-
Stage 2	-	-	-	-	179	-
Critical Hdwy	4.16	-	-	-	6.64	6.44
Critical Hdwy Stg 1	-	-	-	-	5.64	-
Critical Hdwy Stg 2	-	-	-	-	5.64	-
Follow-up Hdwy	2.254	-	-	-	3.716	3.516
Pot Cap-1 Maneuver	1253	-	-	-	572	776
Stage 1	-	-	-	-	774	-
Stage 2	-	-	-	-	802	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1253	-	-	-	553	776
Mov Cap-2 Maneuver	-	-	-	-	553	-
Stage 1	-	-	-	-	748	-
Stage 2	-	-	-	-	802	-
Approach	EB	WB		SB		
HCM Control Delay, s	2.3	0		15.8		
HCM LOS				C		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1253	-	-	-	601	
HCM Lane V/C Ratio	0.032	-	-	-	0.449	
HCM Control Delay (s)	8	0	-	-	15.8	
HCM Lane LOS	A	A	-	-	C	
HCM 95th %tile Q(veh)	0.1	-	-	-	2.3	

HCM 2010 Signalized Intersection Summary
15: Volvo Car Drive & Welcome Center/Factory Entrance

2023 Alt 1 Build Conditions
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	0	79	219	0	72	18	112	25	8	174	5
Future Volume (veh/h)	27	0	79	219	0	72	18	112	25	8	174	5
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727
Adj Flow Rate, veh/h	29	0	86	238	0	78	20	122	27	9	189	5
Adj No. of Lanes	1	1	1	1	1	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	10	10	10	10	10	10	10	10	10	10	10	10
Cap, veh/h	323	164	140	540	393	334	288	338	287	331	320	272
Arrive On Green	0.03	0.00	0.10	0.16	0.00	0.23	0.02	0.20	0.20	0.01	0.19	0.19
Sat Flow, veh/h	1645	1727	1468	1645	1727	1468	1645	1727	1468	1645	1727	1468
Grp Volume(v), veh/h	29	0	86	238	0	78	20	122	27	9	189	5
Grp Sat Flow(s),veh/h/ln	1645	1727	1468	1645	1727	1468	1645	1727	1468	1645	1727	1468
Q Serve(g_s), s	0.7	0.0	2.5	5.3	0.0	1.9	0.4	2.7	0.7	0.2	4.4	0.1
Cycle Q Clear(g_c), s	0.7	0.0	2.5	5.3	0.0	1.9	0.4	2.7	0.7	0.2	4.4	0.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	323	164	140	540	393	334	288	338	287	331	320	272
V/C Ratio(X)	0.09	0.00	0.62	0.44	0.00	0.23	0.07	0.36	0.09	0.03	0.59	0.02
Avail Cap(c_a), veh/h	612	622	529	648	661	562	589	622	529	649	622	529
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.4	0.0	19.3	12.9	0.0	14.0	14.4	15.5	14.6	14.5	16.6	14.8
Incr Delay (d2), s/veh	0.1	0.0	4.3	0.6	0.0	0.4	0.1	0.7	0.1	0.0	1.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	1.2	2.4	0.0	0.8	0.2	1.3	0.3	0.1	2.3	0.1
LnGrp Delay(d),s/veh	17.5	0.0	23.7	13.4	0.0	14.3	14.5	16.1	14.8	14.6	18.3	14.8
LnGrp LOS	B		C	B		B	B	B	B	B	B	B
Approach Vol, veh/h		115			316			169			203	
Approach Delay, s/veh		22.1			13.7			15.7			18.0	
Approach LOS		C			B			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.9	14.2	7.2	16.1	6.4	14.7	13.1	10.2				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	9.0	16.0	9.0	17.0	9.0	16.0	10.0	16.0				
Max Q Clear Time (g_c+I1), s	2.4	6.4	2.7	3.9	2.2	4.7	7.3	4.5				
Green Ext Time (p_c), s	0.0	1.8	0.0	0.1	0.0	1.2	0.2	0.2				
Intersection Summary												
HCM 2010 Ctrl Delay			16.4									
HCM 2010 LOS			B									










June 2019

D.5 2043 BUILD – ALTERNATIVE 1



HCM 2010 TWSC
1: Jedburg Road & Old Dairy Road

2043 Alt 1 Build Conditions
AM Peak Hour

Intersection												
Int Delay, s/veh	137.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	109	4	47	11	8	113	39	930	25	160	625	120
Future Vol, veh/h	109	4	47	11	8	113	39	930	25	160	625	120
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Yield	-	-	None	-	-	None
Storage Length	0	-	250	150	-	150	150	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	34	34	34	34	34	34	11	11	11	11	11	11
Mvmt Flow	115	4	49	12	8	119	41	979	26	168	658	126

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1633	2144	392	1741	2194	503	784	0	0	1005	0	0
Stage 1	1057	1057	-	1074	1074	-	-	-	-	-	-	-
Stage 2	576	1087	-	667	1120	-	-	-	-	-	-	-
Critical Hdwy	8.18	7.18	7.58	8.18	7.18	7.58	4.32	-	-	4.32	-	-
Critical Hdwy Stg 1	7.18	6.18	-	7.18	6.18	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7.18	6.18	-	7.18	6.18	-	-	-	-	-	-	-
Follow-up Hdwy	3.84	4.34	3.64	3.84	4.34	3.64	2.31	-	-	2.31	-	-
Pot Cap-1 Maneuver	~ 48	32	525	39	30	438	774	-	-	633	-	-
Stage 1	190	239	-	185	234	-	-	-	-	-	-	-
Stage 2	398	230	-	346	221	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 19	22	525	23	21	438	774	-	-	633	-	-
Mov Cap-2 Maneuver	~ 19	22	-	23	21	-	-	-	-	-	-	-
Stage 1	180	176	-	175	222	-	-	-	-	-	-	-
Stage 2	264	218	-	225	162	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, \$ 1828.9		52.3	0.4	2.3
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	774	-	-	19	188	23	21	438	633	-	-
HCM Lane V/C Ratio	0.053	-	-	6.039	0.286	0.503	0.401	0.272	0.266	-	-
HCM Control Delay (s)	9.9	-	-	\$ 2669.9	31.6	268.8	263.2	16.3	12.7	-	-
HCM Lane LOS	A	-	-	F	D	F	F	C	B	-	-
HCM 95th %tile Q(veh)	0.2	-	-	14.9	1.1	1.5	1.2	1.1	1.1	-	-




















Notes											
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined				*: All major volume in platoon			

HCM 2010 Signalized Intersection Summary

2: Jedburg Road & I-26 EB Ramps

2043 Alt 1 Build Conditions

AM Peak Hour


















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	28	0	157	0	0	0	0	403	749	356	748	0
Future Volume (veh/h)	28	0	157	0	0	0	0	403	749	356	748	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1473	1473				0	1712	1712	1712	1712	0
Adj Flow Rate, veh/h	29	0	165				0	424	788	375	787	0
Adj No. of Lanes	0	1	1				0	2	1	1	2	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	29	29	29				0	11	11	11	11	0
Cap, veh/h	216	0	193				0	1626	727	480	2287	0
Arrive On Green	0.15	0.00	0.15				0.00	0.50	0.50	0.13	0.70	0.00
Sat Flow, veh/h	1403	0	1252				0	3338	1455	1630	3338	0
Grp Volume(v), veh/h	29	0	165				0	424	788	375	787	0
Grp Sat Flow(s),veh/h/ln	1403	0	1252				0	1626	1455	1630	1626	0
Q Serve(g_s), s	1.5	0.0	10.8				0.0	6.3	42.0	8.6	8.0	0.0
Cycle Q Clear(g_c), s	1.5	0.0	10.8				0.0	6.3	42.0	8.6	8.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	216	0	193				0	1626	727	480	2287	0
V/C Ratio(X)	0.13	0.00	0.86				0.00	0.26	1.08	0.78	0.34	0.00
Avail Cap(c_a), veh/h	267	0	238				0	1626	727	537	2400	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	30.7	0.0	34.6				0.0	12.1	21.0	9.5	4.9	0.0
Incr Delay (d2), s/veh	0.3	0.0	21.6				0.0	0.1	58.2	6.6	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	4.9				0.0	2.8	28.5	5.5	3.5	0.0
LnGrp Delay(d),s/veh	31.0	0.0	56.2				0.0	12.2	79.2	16.1	5.0	0.0
LnGrp LOS	C		E					B	F	B	A	
Approach Vol, veh/h		194						1212			1162	
Approach Delay, s/veh		52.4						55.8			8.6	
Approach LOS		D						E			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	17.1	48.0		18.9		65.1						
Change Period (Y+Rc), s	6.0	6.0		6.0		6.0						
Max Green Setting (Gmax), s	14.0	42.0		16.0		62.0						
Max Q Clear Time (g_c+I1), s	10.6	44.0		12.8		10.0						
Green Ext Time (p_c), s	0.4	0.0		0.3		23.7						
Intersection Summary												
HCM 2010 Ctrl Delay			34.1									
HCM 2010 LOS			C									

HCM 2010 Signalized Intersection Summary

3: Jedburg Road & I-26 WB Ramps











2043 Alt 1 Build Conditions

AM Peak Hour

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	0	194	84	347	0	0	700	109
Future Volume (veh/h)	0	0	0	0	0	194	84	347	0	0	700	109
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				0	0	1727	1712	1712	0	0	1712	1712
Adj Flow Rate, veh/h				0	0	204	88	365	0	0	737	0
Adj No. of Lanes				0	0	1	1	2	0	0	2	1
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				0	0	10	11	11	0	0	11	11
Cap, veh/h				0	0	0	631	2749	0	0	2040	913
Arrive On Green				0.00	0.00	0.00	0.06	0.85	0.00	0.00	0.63	0.00
Sat Flow, veh/h					0		1630	3338	0	0	3338	1455
Grp Volume(v), veh/h					0.0		88	365	0	0	737	0
Grp Sat Flow(s),veh/h/ln							1630	1626	0	0	1626	1455
Q Serve(g_s), s							0.6	0.8	0.0	0.0	4.2	0.0
Cycle Q Clear(g_c), s							0.6	0.8	0.0	0.0	4.2	0.0
Prop In Lane							1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h							631	2749	0	0	2040	913
V/C Ratio(X)							0.14	0.13	0.00	0.00	0.36	0.00
Avail Cap(c_a), veh/h							1074	5116	0	0	3522	1576
HCM Platoon Ratio							1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)							1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh							1.9	0.5	0.0	0.0	3.5	0.0
Incr Delay (d2), s/veh							0.1	0.0	0.0	0.0	0.1	0.0
Initial Q Delay(d3),s/veh							0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln							0.2	0.3	0.0	0.0	1.9	0.0
LnGrp Delay(d),s/veh							2.0	0.5	0.0	0.0	3.6	0.0
LnGrp LOS							A	A			A	
Approach Vol, veh/h								453			737	
Approach Delay, s/veh								0.8			3.6	
Approach LOS								A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6						
Phs Duration (G+Y+Rc), s		38.8			8.4	30.3						
Change Period (Y+Rc), s		6.0			6.0	6.0						
Max Green Setting (Gmax), s		61.0			13.0	42.0						
Max Q Clear Time (g_c+I1), s		2.8			2.6	6.2						
Green Ext Time (p_c), s		9.6			0.1	18.1						
Intersection Summary												
HCM 2010 Ctrl Delay			2.5									
HCM 2010 LOS			A									




HCM 2010 TWSC
4: Jedburg Road & Drop Off Drive

2043 Alt 1 Build Conditions
AM Peak Hour

Intersection												
Int Delay, s/veh	7.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	43	11	120	63	18	18	70	390	81	23	626	70
Future Vol, veh/h	43	11	120	63	18	18	70	390	81	23	626	70
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	175	-	-	200	-	200	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	22	22	22	22	22	22	11	11	11	11	11	11
Mvmt Flow	46	12	128	67	19	19	74	415	86	24	666	74
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1116	1400	370	950	1351	208	740	0	0	501	0	0
Stage 1	751	751	-	563	563	-	-	-	-	-	-	-
Stage 2	365	649	-	387	788	-	-	-	-	-	-	-
Critical Hdwy	7.94	6.94	7.34	7.94	6.94	7.34	4.32	-	-	4.32	-	-
Critical Hdwy Stg 1	6.94	5.94	-	6.94	5.94	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.94	5.94	-	6.94	5.94	-	-	-	-	-	-	-
Follow-up Hdwy	3.72	4.22	3.52	3.72	4.22	3.52	2.31	-	-	2.31	-	-
Pot Cap-1 Maneuver	139	117	573	187	126	740	806	-	-	999	-	-
Stage 1	327	372	-	431	460	-	-	-	-	-	-	-
Stage 2	575	418	-	557	356	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	108	104	573	122	112	740	806	-	-	999	-	-
Mov Cap-2 Maneuver	108	104	-	122	112	-	-	-	-	-	-	-
Stage 1	297	363	-	391	418	-	-	-	-	-	-	-
Stage 2	485	380	-	409	347	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	28.6		52		1.3		0.3					
HCM LOS	D		F									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR		
Capacity (veh/h)	806	-	-	108	416	122	195	999	-	-		
HCM Lane V/C Ratio	0.092	-	-	0.424	0.335	0.549	0.196	0.024	-	-		
HCM Control Delay (s)	9.9	-	-	60.9	18	65.7	27.9	8.7	-	-		
HCM Lane LOS	A	-	-	F	C	F	D	A	-	-		
HCM 95th %tile Q(veh)	0.3	-	-	1.8	1.4	2.6	0.7	0.1	-	-		

Intersection




Int Delay, s/veh 0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	3	0	549	1	0	500
Future Vol, veh/h	3	0	549	1	0	500
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	16	16	16	16
Mvmt Flow	3	0	610	1	0	556

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	889	306	0
Stage 1	611	-	-
Stage 2	278	-	-
Critical Hdwy	6.84	6.94	-
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	5.84	-	-
Follow-up Hdwy	3.52	3.32	-
Pot Cap-1 Maneuver	283	690	-
Stage 1	504	-	-
Stage 2	744	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	283	690	-
Mov Cap-2 Maneuver	283	-	-
Stage 1	504	-	-
Stage 2	744	-	-

Approach	WB	NB	SB
HCM Control Delay, s	17.9	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	283	874
HCM Lane V/C Ratio	-	-	0.012	-
HCM Control Delay (s)	-	-	17.9	0
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0	0

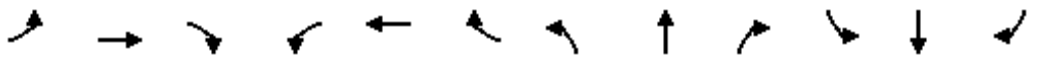
Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	1	0	549	499	4
Future Vol, veh/h	1	1	0	549	499	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	50	50	16	16	16	16
Mvmt Flow	1	1	0	603	548	4
Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	852	276	552	0	-	0
Stage 1	550	-	-	-	-	-
Stage 2	302	-	-	-	-	-
Critical Hdwy	7.8	7.9	4.42	-	-	-
Critical Hdwy Stg 1	6.8	-	-	-	-	-
Critical Hdwy Stg 2	6.8	-	-	-	-	-
Follow-up Hdwy	4	3.8	2.36	-	-	-
Pot Cap-1 Maneuver	220	596	923	-	-	-
Stage 1	426	-	-	-	-	-
Stage 2	599	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	220	596	923	-	-	-
Mov Cap-2 Maneuver	220	-	-	-	-	-
Stage 1	426	-	-	-	-	-
Stage 2	599	-	-	-	-	-
Approach	EB		NB		SB	
HCM Control Delay, s	16.3		0		0	
HCM LOS	C					
Minor Lane/Major Mvmt	NBL		NBT	EBLn1	SBT	SBR
Capacity (veh/h)	923		-	321	-	-
HCM Lane V/C Ratio	-		-	0.007	-	-
HCM Control Delay (s)	0		-	16.3	-	-
HCM Lane LOS	A		-	C	-	-
HCM 95th %tile Q(veh)	0		-	0	-	-

HCM 2010 Signalized Intersection Summary

7: SC 27 & I-26 WB Ramp

2043 Alt 1 Build Conditions

AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↰	↱	↰	↱			↱	↰
Traffic Volume (veh/h)	0	0	0	244	3	267	138	282	0	0	474	26
Future Volume (veh/h)	0	0	0	244	3	267	138	282	0	0	474	26
Number				7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1900	1520	1520	1570	1570	0	0	1570	1900
Adj Flow Rate, veh/h				260	3	0	147	300	0	0	504	0
Adj No. of Lanes				0	1	1	1	2	0	0	2	0
Peak Hour Factor				0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %				25	25	25	21	21	0	0	21	21
Cap, veh/h				361	4	326	386	1470	0	0	809	0
Arrive On Green				0.25	0.25	0.00	0.09	0.49	0.00	0.00	0.27	0.00
Sat Flow, veh/h				1432	17	1292	1495	3062	0	0	3140	0
Grp Volume(v), veh/h				263	0	0	147	300	0	0	504	0
Grp Sat Flow(s),veh/h/ln				1448	0	1292	1495	1492	0	0	1492	0
Q Serve(g_s), s				7.8	0.0	0.0	3.0	2.7	0.0	0.0	7.0	0.0
Cycle Q Clear(g_c), s				7.8	0.0	0.0	3.0	2.7	0.0	0.0	7.0	0.0
Prop In Lane				0.99		1.00	1.00		0.00	0.00		0.00
Lane Grp Cap(c), veh/h				366	0	326	386	1470	0	0	809	0
V/C Ratio(X)				0.72	0.00	0.00	0.38	0.20	0.00	0.00	0.62	0.00
Avail Cap(c_a), veh/h				523	0	467	532	1966	0	0	1015	0
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				16.1	0.0	0.0	10.2	6.7	0.0	0.0	15.0	0.0
Incr Delay (d2), s/veh				2.7	0.0	0.0	0.6	0.1	0.0	0.0	0.8	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				3.3	0.0	0.0	1.3	1.1	0.0	0.0	3.0	0.0
LnGrp Delay(d),s/veh				18.8	0.0	0.0	10.8	6.8	0.0	0.0	15.8	0.0
LnGrp LOS				B			B	A			B	
Approach Vol, veh/h					263			447			504	
Approach Delay, s/veh					18.8			8.1			15.8	
Approach LOS					B			A			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	10.4	18.8		17.9		29.2						
Change Period (Y+Rc), s	6.0	6.0		6.0		6.0						
Max Green Setting (Gmax), s	9.0	16.0		17.0		31.0						
Max Q Clear Time (g_c+I1), s	5.0	9.0		9.8		4.7						
Green Ext Time (p_c), s	0.1	3.8		2.5		5.6						
Intersection Summary												
HCM 2010 Ctrl Delay				13.6								
HCM 2010 LOS				B								




HCM 2010 Signalized Intersection Summary

8: I-26 EB Ramp & SC 27

2043 Alt 1 Build Conditions

AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↩	↪					↕		↩	↕	
Traffic Volume (veh/h)	47	0	122	0	0	0	0	373	358	329	389	0
Future Volume (veh/h)	47	0	122	0	0	0	0	373	358	329	389	0
Number	3	8	18				1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1545	1545				0	1570	1900	1570	1570	0
Adj Flow Rate, veh/h	52	0	0				0	410	0	362	427	0
Adj No. of Lanes	0	1	1				0	2	0	1	2	0
Peak Hour Factor	0.91	0.91	0.91				0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	23	23	23				0	21	21	21	21	0
Cap, veh/h	65	0	58				0	822	0	628	1906	0
Arrive On Green	0.04	0.00	0.00				0.00	0.28	0.00	0.21	0.64	0.00
Sat Flow, veh/h	1471	0	1313				0	3140	0	1495	3062	0
Grp Volume(v), veh/h	52	0	0				0	410	0	362	427	0
Grp Sat Flow(s),veh/h/ln	1471	0	1313				0	1492	0	1495	1492	0
Q Serve(g_s), s	1.3	0.0	0.0				0.0	4.4	0.0	5.6	2.3	0.0
Cycle Q Clear(g_c), s	1.3	0.0	0.0				0.0	4.4	0.0	5.6	2.3	0.0
Prop In Lane	1.00		1.00				0.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	65	0	58				0	822	0	628	1906	0
V/C Ratio(X)	0.79	0.00	0.00				0.00	0.50	0.00	0.58	0.22	0.00
Avail Cap(c_a), veh/h	621	0	554				0	1259	0	716	2518	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00				0.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	17.9	0.0	0.0				0.0	11.5	0.0	6.4	2.9	0.0
Incr Delay (d2), s/veh	19.0	0.0	0.0				0.0	0.5	0.0	0.9	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.0				0.0	1.8	0.0	2.4	0.9	0.0
LnGrp Delay(d),s/veh	37.0	0.0	0.0				0.0	12.0	0.0	7.3	2.9	0.0
LnGrp LOS	D							B		A	A	
Approach Vol, veh/h		52						410			789	
Approach Delay, s/veh		37.0						12.0			4.9	
Approach LOS		D						B			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		30.2			13.8	16.4		7.7				
Change Period (Y+Rc), s		6.0			6.0	6.0		6.0				
Max Green Setting (Gmax), s		32.0			10.0	16.0		16.0				
Max Q Clear Time (g_c+I1), s		4.3			7.6	6.4		3.3				
Green Ext Time (p_c), s		8.5			0.3	4.1		0.5				
Intersection Summary												
HCM 2010 Ctrl Delay			8.6									
HCM 2010 LOS			A									

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	7	724	1	1	509
Future Vol, veh/h	2	7	724	1	1	509
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	21	21	21	21
Mvmt Flow	2	8	796	1	1	559
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	1079	399	0	0	797	0
Stage 1	797	-	-	-	-	-
Stage 2	282	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.52	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.41	-
Pot Cap-1 Maneuver	213	601	-	-	709	-
Stage 1	404	-	-	-	-	-
Stage 2	741	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	213	601	-	-	709	-
Mov Cap-2 Maneuver	213	-	-	-	-	-
Stage 1	404	-	-	-	-	-
Stage 2	740	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	13.6	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	- 428		709	-	
HCM Lane V/C Ratio	-	- 0.023		0.002	-	
HCM Control Delay (s)	-	- 13.6		10.1	0	
HCM Lane LOS	-	- B		B	A	
HCM 95th %tile Q(veh)	-	- 0.1		0	-	

Intersection												
Int Delay, s/veh	3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	8	8	31	39	4	19	10	207	46	16	134	1
Future Vol, veh/h	8	8	31	39	4	19	10	207	46	16	134	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	23	23	23	23	23	23	36	36	36	36	36	36
Mvmt Flow	9	9	34	43	4	21	11	230	51	18	149	1
Major/Minor	Minor2		Minor1		Major1				Major2			
Conflicting Flow All	476	489	150	485	464	256	150	0	0	281	0	0
Stage 1	186	186	-	278	278	-	-	-	-	-	-	-
Stage 2	290	303	-	207	186	-	-	-	-	-	-	-
Critical Hdwy	7.33	6.73	6.43	7.33	6.73	6.43	4.46	-	-	4.46	-	-
Critical Hdwy Stg 1	6.33	5.73	-	6.33	5.73	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.33	5.73	-	6.33	5.73	-	-	-	-	-	-	-
Follow-up Hdwy	3.707	4.207	3.507	3.707	4.207	3.507	2.524	-	-	2.524	-	-
Pot Cap-1 Maneuver	466	450	844	460	466	734	1248	-	-	1109	-	-
Stage 1	769	708	-	685	644	-	-	-	-	-	-	-
Stage 2	675	627	-	749	708	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	439	437	844	425	452	734	1248	-	-	1109	-	-
Mov Cap-2 Maneuver	439	437	-	425	452	-	-	-	-	-	-	-
Stage 1	761	695	-	677	637	-	-	-	-	-	-	-
Stage 2	644	620	-	696	695	-	-	-	-	-	-	-
Approach	EB		WB		NB				SB			
HCM Control Delay, s	11.1		13.5		0.3				0.9			
HCM LOS	B		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1248	-	-	642	490	1109	-	-				
HCM Lane V/C Ratio	0.009	-	-	0.081	0.141	0.016	-	-				
HCM Control Delay (s)	7.9	0	-	11.1	13.5	8.3	0	-				
HCM Lane LOS	A	A	-	B	B	A	A	-				
HCM 95th %tile Q(veh)	0	-	-	0.3	0.5	0	-	-				




Intersection												
Int Delay, s/veh	4.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔			↔			↔	
Traffic Vol, veh/h	0	0	0	71	3	118	33	145	0	0	174	30
Future Vol, veh/h	0	0	0	71	3	118	33	145	0	0	174	30
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	46	46	46	46	46	46	36	36	36	36	36	36
Mvmt Flow	0	0	0	76	3	126	35	154	0	0	185	32
Major/Minor												
Minor1				Major1				Major2				
Conflicting Flow All	425	441	154	217	0	-	-	-	-	-	0	
Stage 1	224	224	-	-	-	-	-	-	-	-	-	
Stage 2	201	217	-	-	-	-	-	-	-	-	-	
Critical Hdwy	6.86	6.96	6.66	4.46	-	-	-	-	-	-	-	
Critical Hdwy Stg 1	5.86	5.96	-	-	-	-	-	-	-	-	-	
Critical Hdwy Stg 2	5.86	5.96	-	-	-	-	-	-	-	-	-	
Follow-up Hdwy	3.914	4.414	3.714	2.524	-	-	-	-	-	-	-	
Pot Cap-1 Maneuver	511	450	788	1175	-	0	0	-	-	-	-	
Stage 1	720	644	-	-	-	0	0	-	-	-	-	
Stage 2	738	649	-	-	-	0	0	-	-	-	-	
Platoon blocked, %					-					-	-	
Mov Cap-1 Maneuver	494	0	788	1175	-	-	-	-	-	-	-	
Mov Cap-2 Maneuver	494	0	-	-	-	-	-	-	-	-	-	
Stage 1	696	0	-	-	-	-	-	-	-	-	-	
Stage 2	738	0	-	-	-	-	-	-	-	-	-	
Approach												
WB				NB				SB				
HCM Control Delay, s	13.2			1.5				0				
HCM LOS	B											
Minor Lane/Major Mvmt												
NBL				NBTWBLn1				SBT SBR				
Capacity (veh/h)	1175	-	644	-	-							
HCM Lane V/C Ratio	0.03	-	0.317	-	-							
HCM Control Delay (s)	8.2	0	13.2	-	-							
HCM Lane LOS	A	A	B	-	-							
HCM 95th %tile Q(veh)	0.1	-	1.4	-	-							

Intersection												
Int Delay, s/veh	3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Traffic Vol, veh/h	34	3	30	0	0	0	0	144	83	85	160	0
Future Vol, veh/h	34	3	30	0	0	0	0	144	83	85	160	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	53	53	53	53	53	53	36	36	36	36	36	36
Mvmt Flow	38	3	33	0	0	0	0	160	92	94	178	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	572	618	178	-	0	0	252	0	0
Stage 1	366	366	-	-	-	-	-	-	-
Stage 2	206	252	-	-	-	-	-	-	-
Critical Hdwy	6.93	7.03	6.73	-	-	-	4.46	-	-
Critical Hdwy Stg 1	5.93	6.03	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.93	6.03	-	-	-	-	-	-	-
Follow-up Hdwy	3.977	4.477	3.777	-	-	-	2.524	-	-
Pot Cap-1 Maneuver	406	345	749	0	-	-	1139	-	0
Stage 1	602	542	-	0	-	-	-	-	0
Stage 2	721	614	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	369	0	749	-	-	-	1139	-	-
Mov Cap-2 Maneuver	369	0	-	-	-	-	-	-	-
Stage 1	602	0	-	-	-	-	-	-	-
Stage 2	655	0	-	-	-	-	-	-	-

























Approach	EB	NB	SB
HCM Control Delay, s	13.8	0	2.9
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	SBL	SBT
Capacity (veh/h)	-	-	484	1139	-
HCM Lane V/C Ratio	-	-	0.154	0.083	-
HCM Control Delay (s)	-	-	13.8	8.4	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.5	0.3	-

Intersection						
Int Delay, s/veh	6.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	81	100	66	146	134	56
Future Vol, veh/h	81	100	66	146	134	56
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	19	19	36	36	36	36
Mvmt Flow	89	110	73	160	147	62
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	233	0	-	0	441	153
Stage 1	-	-	-	-	153	-
Stage 2	-	-	-	-	288	-
Critical Hdwy	4.29	-	-	-	6.76	6.56
Critical Hdwy Stg 1	-	-	-	-	5.76	-
Critical Hdwy Stg 2	-	-	-	-	5.76	-
Follow-up Hdwy	2.371	-	-	-	3.824	3.624
Pot Cap-1 Maneuver	1241	-	-	-	515	811
Stage 1	-	-	-	-	799	-
Stage 2	-	-	-	-	689	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1241	-	-	-	476	811
Mov Cap-2 Maneuver	-	-	-	-	476	-
Stage 1	-	-	-	-	738	-
Stage 2	-	-	-	-	689	-
Approach	EB	WB		SB		
HCM Control Delay, s	3.6	0		15.7		
HCM LOS				C		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1241	-	-	-	542	
HCM Lane V/C Ratio	0.072	-	-	-	0.385	
HCM Control Delay (s)	8.1	0	-	-	15.7	
HCM Lane LOS	A	A	-	-	C	
HCM 95th %tile Q(veh)	0.2	-	-	-	1.8	










HCM 2010 Signalized Intersection Summary
15: Volvo Car Drive & Welcome Center/Factory Entrance

2043 Alt 1 Build Conditions
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	0	13	161	0	54	97	801	30	11	451	32
Future Volume (veh/h)	4	0	13	161	0	54	97	801	30	11	451	32
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727
Adj Flow Rate, veh/h	4	0	14	175	0	59	105	871	33	12	490	35
Adj No. of Lanes	1	1	1	1	1	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	10	10	10	10	10	10	10	10	10	10	10	10
Cap, veh/h	138	67	57	302	238	202	446	987	839	179	924	785
Arrive On Green	0.00	0.00	0.04	0.10	0.00	0.14	0.05	0.57	0.57	0.01	0.53	0.53
Sat Flow, veh/h	1645	1727	1468	1645	1727	1468	1645	1727	1468	1645	1727	1468
Grp Volume(v), veh/h	4	0	14	175	0	59	105	871	33	12	490	35
Grp Sat Flow(s),veh/h/ln	1645	1727	1468	1645	1727	1468	1645	1727	1468	1645	1727	1468
Q Serve(g_s), s	0.2	0.0	0.8	8.7	0.0	3.1	2.5	38.0	0.9	0.3	16.1	1.0
Cycle Q Clear(g_c), s	0.2	0.0	0.8	8.7	0.0	3.1	2.5	38.0	0.9	0.3	16.1	1.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	138	67	57	302	238	202	446	987	839	179	924	785
V/C Ratio(X)	0.03	0.00	0.25	0.58	0.00	0.29	0.24	0.88	0.04	0.07	0.53	0.04
Avail Cap(c_a), veh/h	300	317	269	302	317	269	536	1030	875	329	1030	875
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.0	0.0	40.7	34.1	0.0	33.8	9.8	16.2	8.2	16.2	13.2	9.7
Incr Delay (d2), s/veh	0.1	0.0	2.2	2.7	0.0	0.8	0.3	8.9	0.0	0.2	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.4	4.1	0.0	1.3	1.1	20.3	0.3	0.1	7.7	0.4
LnGrp Delay(d),s/veh	40.1	0.0	42.9	36.8	0.0	34.6	10.1	25.1	8.2	16.3	13.7	9.7
LnGrp LOS	D		D	D		C	B	C	A	B	B	A
Approach Vol, veh/h	18		234				1009				537	
Approach Delay, s/veh	42.3		36.2				23.0				13.5	
Approach LOS	D		D				C				B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.2	52.6	6.4	18.0	7.0	55.8	15.0	9.4				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	9.0	52.0	9.0	16.0	9.0	52.0	9.0	16.0				
Max Q Clear Time (g_c+I1), s	4.5	18.1	2.2	5.1	2.3	40.0	10.7	2.8				
Green Ext Time (p_c), s	0.1	11.8	0.0	0.1	0.0	9.8	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay	22.0											
HCM 2010 LOS	C											

HCM 2010 TWSC
1: Jedburg Road & Old Dairy Road

2043 Alt 1 Build Conditions
PM Peak Hour

Intersection												
Int Delay, s/veh	432.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	88	10	72	14	14	205	37	810	30	132	983	147
Future Vol, veh/h	88	10	72	14	14	205	37	810	30	132	983	147
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Yield	-	-	None	-	-	None
Storage Length	0	-	250	150	-	150	175	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	9	9	9	9	9	9	7	7	7	7	7	7
Mvmt Flow	97	11	79	15	15	225	41	890	33	145	1080	162

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1986	2456	621	1825	2521	462	1242	0	0	923	0	0
Stage 1	1451	1451	-	989	989	-	-	-	-	-	-	-
Stage 2	535	1005	-	836	1532	-	-	-	-	-	-	-
Critical Hdwy	7.68	6.68	7.08	7.68	6.68	7.08	4.24	-	-	4.24	-	-
Critical Hdwy Stg 1	6.68	5.68	-	6.68	5.68	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.68	5.68	-	6.68	5.68	-	-	-	-	-	-	-
Follow-up Hdwy	3.59	4.09	3.39	3.59	4.09	3.39	2.27	-	-	2.27	-	-
Pot Cap-1 Maneuver	~ 33	27	414	44	25	528	530	-	-	705	-	-
Stage 1	128	182	-	252	308	-	-	-	-	-	-	-
Stage 2	479	302	-	313	166	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	~ 4	20	414	16	18	528	530	-	-	705	-	-
Mov Cap-2 Maneuver	~ 4	20	-	16	18	-	-	-	-	-	-	-
Stage 1	118	145	-	233	284	-	-	-	-	-	-	-
Stage 2	240	279	-	186	132	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, \$ 6359.6		74	0.5	1.2
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	530	-	-	4	122	16	18	528	705	-	-
HCM Lane V/C Ratio	0.077	-	-	24.176	0.739	0.962	0.855	0.427	0.206	-	-
HCM Control Delay (s)	12.4	-	-	\$ 12200.9	90.9\$	533.5\$	451.6	16.8	11.4	-	-
HCM Lane LOS	B	-	-	F	F	F	F	C	B	-	-
HCM 95th %tile Q(veh)	0.2	-	-	14.2	4.2	2.4	2.2	2.1	0.8	-	-

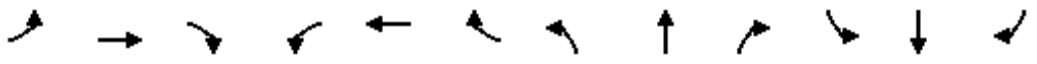
Notes											
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined				*: All major volume in platoon			

HCM 2010 Signalized Intersection Summary

2: Jedburg Road & I-26 EB Ramps

2043 Alt 1 Build Conditions

PM Peak Hour




















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↩	↩					↩↩	↩	↩	↩↩	
Traffic Volume (veh/h)	74	3	125	0	0	0	0	476	627	194	1137	0
Future Volume (veh/h)	74	3	125	0	0	0	0	476	627	194	1137	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1597	1597				0	1776	1776	1776	1776	0
Adj Flow Rate, veh/h	78	3	132				0	501	660	204	1197	0
Adj No. of Lanes	0	1	1				0	2	1	1	2	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	19	19	19				0	7	7	7	7	0
Cap, veh/h	195	7	180				0	1813	811	443	2360	0
Arrive On Green	0.13	0.13	0.13				0.00	0.54	0.54	0.08	0.70	0.00
Sat Flow, veh/h	1467	56	1357				0	3463	1509	1691	3463	0
Grp Volume(v), veh/h	81	0	132				0	501	660	204	1197	0
Grp Sat Flow(s),veh/h/ln	1523	0	1357				0	1687	1509	1691	1687	0
Q Serve(g_s), s	3.5	0.0	6.7				0.0	5.8	25.7	3.5	11.8	0.0
Cycle Q Clear(g_c), s	3.5	0.0	6.7				0.0	5.8	25.7	3.5	11.8	0.0
Prop In Lane	0.96		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	202	0	180				0	1813	811	443	2360	0
V/C Ratio(X)	0.40	0.00	0.73				0.00	0.28	0.81	0.46	0.51	0.00
Avail Cap(c_a), veh/h	341	0	304				0	2218	992	523	2925	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	28.4	0.0	29.8				0.0	9.0	13.6	5.9	5.0	0.0
Incr Delay (d2), s/veh	1.3	0.0	5.7				0.0	0.1	4.4	0.7	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	2.8				0.0	2.7	11.6	1.7	5.4	0.0
LnGrp Delay(d),s/veh	29.7	0.0	35.5				0.0	9.1	18.0	6.7	5.2	0.0
LnGrp LOS	C		D					A	B	A	A	
Approach Vol, veh/h		213						1161			1401	
Approach Delay, s/veh		33.3						14.1			5.4	
Approach LOS		C						B			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	11.6	44.4		15.5		56.0						
Change Period (Y+Rc), s	6.0	6.0		6.0		6.0						
Max Green Setting (Gmax), s	9.0	47.0		16.0		62.0						
Max Q Clear Time (g_c+I1), s	5.5	27.7		8.7		13.8						
Green Ext Time (p_c), s	0.2	10.7		0.9		35.7						
Intersection Summary												
HCM 2010 Ctrl Delay			11.2									
HCM 2010 LOS			B									

HCM 2010 Signalized Intersection Summary

3: Jedburg Road & I-26 WB Ramps










2043 Alt 1 Build Conditions




PM Peak Hour

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	0	355	107	443	0	0	529	91
Future Volume (veh/h)	0	0	0	0	0	355	107	443	0	0	529	91
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				0	0	1792	1776	1776	0	0	1776	1776
Adj Flow Rate, veh/h				0	0	374	113	466	0	0	557	0
Adj No. of Lanes				0	0	1	1	2	0	0	2	1
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				0	0	6	7	7	0	0	7	7
Cap, veh/h				0	0	0	724	2719	0	0	1793	802
Arrive On Green				0.00	0.00	0.00	0.08	0.81	0.00	0.00	0.53	0.00
Sat Flow, veh/h					0		1691	3463	0	0	3463	1509
Grp Volume(v), veh/h					0.0		113	466	0	0	557	0
Grp Sat Flow(s),veh/h/ln							1691	1687	0	0	1687	1509
Q Serve(g_s), s							0.7	1.0	0.0	0.0	2.9	0.0
Cycle Q Clear(g_c), s							0.7	1.0	0.0	0.0	2.9	0.0
Prop In Lane							1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h							724	2719	0	0	1793	802
V/C Ratio(X)							0.16	0.17	0.00	0.00	0.31	0.00
Avail Cap(c_a), veh/h							1190	5349	0	0	3493	1563
HCM Platoon Ratio							1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)							1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh							2.2	0.7	0.0	0.0	4.1	0.0
Incr Delay (d2), s/veh							0.1	0.0	0.0	0.0	0.1	0.0
Initial Q Delay(d3),s/veh							0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln							0.3	0.4	0.0	0.0	1.3	0.0
LnGrp Delay(d),s/veh							2.3	0.7	0.0	0.0	4.2	0.0
LnGrp LOS							A	A			A	
Approach Vol, veh/h								579			557	
Approach Delay, s/veh								1.0			4.2	
Approach LOS								A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6						
Phs Duration (G+Y+Rc), s		30.9			8.5	22.4						
Change Period (Y+Rc), s		6.0			6.0	6.0						
Max Green Setting (Gmax), s		49.0			11.0	32.0						
Max Q Clear Time (g_c+I1), s		3.0			2.7	4.9						
Green Ext Time (p_c), s		12.0			0.2	11.6						
Intersection Summary												
HCM 2010 Ctrl Delay			2.6									
HCM 2010 LOS			A									

HCM 2010 TWSC
4: Jedburg Road & Drop Off Drive




2043 Alt 1 Build Conditions
PM Peak Hour

Intersection												
Int Delay, s/veh	11.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	36	10	105	88	10	33	91	649	58	18	427	76
Future Vol, veh/h	36	10	105	88	10	33	91	649	58	18	427	76
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	175	-	-	200	-	200	175	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	8	8	8	8	8	8	7	7	7	7	7	7
Mvmt Flow	39	11	113	95	11	35	98	698	62	19	459	82
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1089	1494	271	1167	1473	349	541	0	0	760	0	0
Stage 1	538	538	-	894	894	-	-	-	-	-	-	-
Stage 2	551	956	-	273	579	-	-	-	-	-	-	-
Critical Hdwy	7.66	6.66	7.06	7.66	6.66	7.06	4.24	-	-	4.24	-	-
Critical Hdwy Stg 1	6.66	5.66	-	6.66	5.66	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.66	5.66	-	6.66	5.66	-	-	-	-	-	-	-
Follow-up Hdwy	3.58	4.08	3.38	3.58	4.08	3.38	2.27	-	-	2.27	-	-
Pot Cap-1 Maneuver	162	115	709	142	119	630	990	-	-	816	-	-
Stage 1	480	506	-	290	344	-	-	-	-	-	-	-
Stage 2	471	321	-	693	484	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	128	101	709	100	105	630	990	-	-	816	-	-
Mov Cap-2 Maneuver	128	101	-	100	105	-	-	-	-	-	-	-
Stage 1	432	494	-	261	310	-	-	-	-	-	-	-
Stage 2	387	289	-	557	473	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	22.5		109.4		1		0.3					
HCM LOS	C		F									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR		
Capacity (veh/h)	990	-	-	128	465	100	291	816	-	-		
HCM Lane V/C Ratio	0.099	-	-	0.302	0.266	0.946	0.159	0.024	-	-		
HCM Control Delay (s)	9	-	-	44.9	15.5	153.3	19.7	9.5	-	-		
HCM Lane LOS	A	-	-	E	C	F	C	A	-	-		
HCM 95th %tile Q(veh)	0.3	-	-	1.2	1.1	5.6	0.6	0.1	-	-		

Intersection						
Int Delay, s/veh	0.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	9	1	596	6	3	766
Future Vol, veh/h	9	1	596	6	3	766
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	7	7	7	7
Mvmt Flow	10	1	662	7	3	851
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	1098	335	0	0	669	0
Stage 1	666	-	-	-	-	-
Stage 2	432	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.24	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.27	-
Pot Cap-1 Maneuver	207	661	-	-	884	-
Stage 1	472	-	-	-	-	-
Stage 2	622	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	206	661	-	-	884	-
Mov Cap-2 Maneuver	206	-	-	-	-	-
Stage 1	469	-	-	-	-	-
Stage 2	622	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	22.2	0		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	221	884	-	
HCM Lane V/C Ratio	-	-	0.05	0.004	-	
HCM Control Delay (s)	-	-	22.2	9.1	0	
HCM Lane LOS	-	-	C	A	A	
HCM 95th %tile Q(veh)	-	-	0.2	0	-	

Intersection

Int Delay, s/veh 0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	1	0	601	772	3
Future Vol, veh/h	1	1	0	601	772	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	50	50	7	7	7	7
Mvmt Flow	1	1	0	668	858	3

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1194	431	861
Stage 1	860	-	-
Stage 2	334	-	-
Critical Hdwy	7.8	7.9	4.24
Critical Hdwy Stg 1	6.8	-	-
Critical Hdwy Stg 2	6.8	-	-
Follow-up Hdwy	4	3.8	2.27
Pot Cap-1 Maneuver	122	458	745
Stage 1	275	-	-
Stage 2	573	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	122	458	745
Mov Cap-2 Maneuver	122	-	-
Stage 1	275	-	-
Stage 2	573	-	-

Approach	EB	NB	SB
HCM Control Delay, s	23.9	0	0
HCM LOS	C		

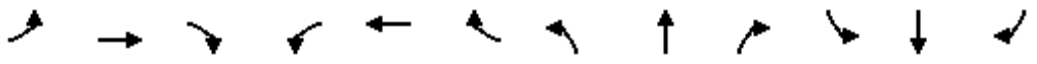
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	745	-	193	-	-
HCM Lane V/C Ratio	-	-	0.012	-	-
HCM Control Delay (s)	0	-	23.9	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

HCM 2010 Signalized Intersection Summary

7: SC 27 & I-26 WB Ramp

2043 Alt 1 Build Conditions

PM Peak Hour


















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↰	↱	↰	↱			↱	↰
Traffic Volume (veh/h)	0	0	0	306	3	380	132	221	0	0	690	83
Future Volume (veh/h)	0	0	0	306	3	380	132	221	0	0	690	83
Number				7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1900	1776	1776	1712	1712	0	0	1712	1900
Adj Flow Rate, veh/h				340	3	0	147	246	0	0	767	0
Adj No. of Lanes				0	1	1	1	2	0	0	2	0
Peak Hour Factor				0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %				7	7	7	11	11	0	0	11	11
Cap, veh/h				440	4	396	338	1653	0	0	1002	0
Arrive On Green				0.26	0.26	0.00	0.09	0.51	0.00	0.00	0.31	0.00
Sat Flow, veh/h				1677	15	1509	1630	3338	0	0	3423	0
Grp Volume(v), veh/h				343	0	0	147	246	0	0	767	0
Grp Sat Flow(s),veh/h/ln				1692	0	1509	1630	1626	0	0	1626	0
Q Serve(g_s), s				9.8	0.0	0.0	2.9	2.1	0.0	0.0	11.2	0.0
Cycle Q Clear(g_c), s				9.8	0.0	0.0	2.9	2.1	0.0	0.0	11.2	0.0
Prop In Lane				0.99		1.00	1.00		0.00	0.00		0.00
Lane Grp Cap(c), veh/h				444	0	396	338	1653	0	0	1002	0
V/C Ratio(X)				0.77	0.00	0.00	0.44	0.15	0.00	0.00	0.77	0.00
Avail Cap(c_a), veh/h				518	0	462	479	1990	0	0	1057	0
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				17.9	0.0	0.0	11.4	6.8	0.0	0.0	16.4	0.0
Incr Delay (d2), s/veh				6.2	0.0	0.0	0.9	0.0	0.0	0.0	3.2	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				5.3	0.0	0.0	1.3	0.9	0.0	0.0	5.5	0.0
LnGrp Delay(d),s/veh				24.0	0.0	0.0	12.3	6.9	0.0	0.0	19.6	0.0
LnGrp LOS				C			B	A			B	
Approach Vol, veh/h					343			393			767	
Approach Delay, s/veh					24.0			8.9			19.6	
Approach LOS					C			A			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	10.5	22.1		19.7		32.6						
Change Period (Y+Rc), s	6.0	6.0		6.0		6.0						
Max Green Setting (Gmax), s	9.0	17.0		16.0		32.0						
Max Q Clear Time (g_c+I1), s	4.9	13.2		11.8		4.1						
Green Ext Time (p_c), s	0.1	2.9		2.0		4.6						
Intersection Summary												
HCM 2010 Ctrl Delay				17.8								
HCM 2010 LOS				B								




HCM 2010 Signalized Intersection Summary

8: I-26 EB Ramp & SC 27

2043 Alt 1 Build Conditions

PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	0	161	0	0	0	0	323	250	453	543	0
Future Volume (veh/h)	30	0	161	0	0	0	0	323	250	453	543	0
Number	3	8	18				1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1759	1759				0	1712	1900	1712	1712	0
Adj Flow Rate, veh/h	33	0	0				0	359	0	503	603	0
Adj No. of Lanes	0	1	1				0	2	0	1	2	0
Peak Hour Factor	0.90	0.90	0.90				0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	8	8	8				0	11	11	11	11	0
Cap, veh/h	52	0	46				0	784	0	759	2156	0
Arrive On Green	0.03	0.00	0.00				0.00	0.24	0.00	0.27	0.66	0.00
Sat Flow, veh/h	1675	0	1495				0	3423	0	1630	3338	0
Grp Volume(v), veh/h	33	0	0				0	359	0	503	603	0
Grp Sat Flow(s),veh/h/ln	1675	0	1495				0	1626	0	1630	1626	0
Q Serve(g_s), s	0.8	0.0	0.0				0.0	3.7	0.0	7.7	3.0	0.0
Cycle Q Clear(g_c), s	0.8	0.0	0.0				0.0	3.7	0.0	7.7	3.0	0.0
Prop In Lane	1.00		1.00				0.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	52	0	46				0	784	0	759	2156	0
V/C Ratio(X)	0.64	0.00	0.00				0.00	0.46	0.00	0.66	0.28	0.00
Avail Cap(c_a), veh/h	684	0	611				0	1328	0	945	3072	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00				0.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	18.8	0.0	0.0				0.0	12.7	0.0	6.4	2.7	0.0
Incr Delay (d2), s/veh	12.4	0.0	0.0				0.0	0.4	0.0	1.2	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.0				0.0	1.7	0.0	3.5	1.4	0.0
LnGrp Delay(d),s/veh	31.2	0.0	0.0				0.0	13.1	0.0	7.6	2.8	0.0
LnGrp LOS	C							B		A	A	
Approach Vol, veh/h		33						359			1106	
Approach Delay, s/veh		31.2						13.1			5.0	
Approach LOS		C						B			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		32.0			16.5	15.4		7.2				
Change Period (Y+Rc), s		6.0			6.0	6.0		6.0				
Max Green Setting (Gmax), s		37.0			15.0	16.0		16.0				
Max Q Clear Time (g_c+I1), s		5.0			9.7	5.7		2.8				
Green Ext Time (p_c), s		13.1			0.9	3.7		0.2				
Intersection Summary												
HCM 2010 Ctrl Delay			7.5									
HCM 2010 LOS			A									




Intersection						
Int Delay, s/veh	0.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	6	6	567	10	12	691
Future Vol, veh/h	6	6	567	10	12	691
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	11	11	11	11
Mvmt Flow	6	6	603	11	13	735
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	1003	307	0	0	614	0
Stage 1	609	-	-	-	-	-
Stage 2	394	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.32	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.31	-
Pot Cap-1 Maneuver	239	689	-	-	903	-
Stage 1	505	-	-	-	-	-
Stage 2	650	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	233	689	-	-	903	-
Mov Cap-2 Maneuver	233	-	-	-	-	-
Stage 1	493	-	-	-	-	-
Stage 2	650	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	15.7	0		0.3		
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	348	903	-	
HCM Lane V/C Ratio	-	-	0.037	0.014	-	
HCM Control Delay (s)	-	-	15.7	9	0.1	
HCM Lane LOS	-	-	C	A	A	
HCM 95th %tile Q(veh)	-	-	0.1	0	-	

Intersection												
Int Delay, s/veh	5.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	8	3	28	126	11	21	25	157	36	21	178	15
Future Vol, veh/h	8	3	28	126	11	21	25	157	36	21	178	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	8	8	8	8	8	8	24	24	24	24	24	24
Mvmt Flow	9	3	31	138	12	23	27	173	40	23	196	16

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	515	517	204	514	505	193	212	0	0	213	0	0
Stage 1	250	250	-	247	247	-	-	-	-	-	-	-
Stage 2	265	267	-	267	258	-	-	-	-	-	-	-
Critical Hdwy	7.18	6.58	6.28	7.18	6.58	6.28	4.34	-	-	4.34	-	-
Critical Hdwy Stg 1	6.18	5.58	-	6.18	5.58	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.18	5.58	-	6.18	5.58	-	-	-	-	-	-	-
Follow-up Hdwy	3.572	4.072	3.372	3.572	4.072	3.372	2.416	-	-	2.416	-	-
Pot Cap-1 Maneuver	461	454	822	462	461	833	1238	-	-	1237	-	-
Stage 1	741	689	-	744	691	-	-	-	-	-	-	-
Stage 2	727	677	-	725	683	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	424	434	822	427	440	833	1238	-	-	1237	-	-
Mov Cap-2 Maneuver	424	434	-	427	440	-	-	-	-	-	-	-
Stage 1	722	675	-	725	674	-	-	-	-	-	-	-
Stage 2	677	660	-	680	669	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	10.9		17.6		0.9		0.8	
HCM LOS	B		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1238	-	-	652	458	1237	-
HCM Lane V/C Ratio	0.022	-	-	0.066	0.379	0.019	-
HCM Control Delay (s)	8	0	-	10.9	17.6	8	0
HCM Lane LOS	A	A	-	B	C	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0.2	1.7	0.1	-




Intersection												
Int Delay, s/veh	4.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	95	0	103	34	115	0	0	297	35
Future Vol, veh/h	0	0	0	95	0	103	34	115	0	0	297	35
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	21	21	21	21	21	21	24	24	24	24	24	24
Mvmt Flow	0	0	0	106	0	114	38	128	0	0	330	39
Major/Minor				Minor1		Major1		Major2				
Conflicting Flow All				554	573	128	369	0	-	-	-	0
Stage 1				204	204	-	-	-	-	-	-	-
Stage 2				350	369	-	-	-	-	-	-	-
Critical Hdwy				6.61	6.71	6.41	4.34	-	-	-	-	-
Critical Hdwy Stg 1				5.61	5.71	-	-	-	-	-	-	-
Critical Hdwy Stg 2				5.61	5.71	-	-	-	-	-	-	-
Follow-up Hdwy				3.689	4.189	3.489	2.416	-	-	-	-	-
Pot Cap-1 Maneuver				462	405	874	1078	-	0	0	-	-
Stage 1				787	699	-	-	-	0	0	-	-
Stage 2				673	589	-	-	-	0	0	-	-
Platoon blocked, %								-			-	-
Mov Cap-1 Maneuver				444	0	874	1078	-	-	-	-	-
Mov Cap-2 Maneuver				444	0	-	-	-	-	-	-	-
Stage 1				757	0	-	-	-	-	-	-	-
Stage 2				673	0	-	-	-	-	-	-	-
Approach				WB		NB		SB				
HCM Control Delay, s				14.5		1.9		0				
HCM LOS				B								
Minor Lane/Major Mvmt	NBL	NBT	WBLn1	SBT	SBR							
Capacity (veh/h)	1078	-	597	-	-							
HCM Lane V/C Ratio	0.035	-	0.369	-	-							
HCM Control Delay (s)	8.5	0	14.5	-	-							
HCM Lane LOS	A	A	B	-	-							
HCM 95th %tile Q(veh)	0.1	-	1.7	-	-							

Intersection												
Int Delay, s/veh	2.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Traffic Vol, veh/h	13	0	24	0	0	0	0	136	66	128	264	0
Future Vol, veh/h	13	0	24	0	0	0	0	136	66	128	264	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	52	52	52	52	52	52	24	24	24	24	24	24
Mvmt Flow	14	0	27	0	0	0	0	151	73	142	293	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	765	801	293	-	0	0	224	0	0
Stage 1	577	577	-	-	-	-	-	-	-
Stage 2	188	224	-	-	-	-	-	-	-
Critical Hdwy	6.92	7.02	6.72	-	-	-	4.34	-	-
Critical Hdwy Stg 1	5.92	6.02	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.92	6.02	-	-	-	-	-	-	-
Follow-up Hdwy	3.968	4.468	3.768	-	-	-	2.416	-	-
Pot Cap-1 Maneuver	309	267	642	0	-	-	1225	-	0
Stage 1	475	430	-	0	-	-	-	-	0
Stage 2	737	635	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	266	0	642	-	-	-	1225	-	-
Mov Cap-2 Maneuver	266	0	-	-	-	-	-	-	-
Stage 1	409	0	-	-	-	-	-	-	-
Stage 2	737	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.3	0	2.7
HCM LOS	B		

























Minor Lane/Major Mvmt	NBT	NBR	EBLn1	SBL	SBT
Capacity (veh/h)	-	-	429	1225	-
HCM Lane V/C Ratio	-	-	0.096	0.116	-
HCM Control Delay (s)	-	-	14.3	8.3	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0.4	-

Intersection						
Int Delay, s/veh	8.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	43	106	146	159	209	79
Future Vol, veh/h	43	106	146	159	209	79
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	6	6	24	24	24	24
Mvmt Flow	48	118	162	177	232	88
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	339	0	-	0	465	251
Stage 1	-	-	-	-	251	-
Stage 2	-	-	-	-	214	-
Critical Hdwy	4.16	-	-	-	6.64	6.44
Critical Hdwy Stg 1	-	-	-	-	5.64	-
Critical Hdwy Stg 2	-	-	-	-	5.64	-
Follow-up Hdwy	2.254	-	-	-	3.716	3.516
Pot Cap-1 Maneuver	1198	-	-	-	517	737
Stage 1	-	-	-	-	742	-
Stage 2	-	-	-	-	772	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1198	-	-	-	495	737
Mov Cap-2 Maneuver	-	-	-	-	495	-
Stage 1	-	-	-	-	710	-
Stage 2	-	-	-	-	772	-
Approach	EB	WB		SB		
HCM Control Delay, s	2.3	0		20.6		
HCM LOS				C		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1198	-	-	-	544	
HCM Lane V/C Ratio	0.04	-	-	-	0.588	
HCM Control Delay (s)	8.1	0	-	-	20.6	
HCM Lane LOS	A	A	-	-	C	
HCM 95th %tile Q(veh)	0.1	-	-	-	3.8	

HCM 2010 Signalized Intersection Summary

15: Volvo Car Drive & Welcome Center/Factory Entrance

2043 Alt 1 Build Conditions
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	56	0	171	15	0	4	32	386	15	4	593	12
Future Volume (veh/h)	56	0	171	15	0	4	32	386	15	4	593	12
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727
Adj Flow Rate, veh/h	61	0	186	16	0	4	35	420	16	4	645	13
Adj No. of Lanes	1	1	1	1	1	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	10	10	10	10	10	10	10	10	10	10	10	10
Cap, veh/h	345	268	228	275	222	188	233	806	685	374	764	649
Arrive On Green	0.04	0.00	0.16	0.02	0.00	0.13	0.03	0.47	0.47	0.00	0.44	0.44
Sat Flow, veh/h	1645	1727	1468	1645	1727	1468	1645	1727	1468	1645	1727	1468
Grp Volume(v), veh/h	61	0	186	16	0	4	35	420	16	4	645	13
Grp Sat Flow(s),veh/h/ln	1645	1727	1468	1645	1727	1468	1645	1727	1468	1645	1727	1468
Q Serve(g_s), s	2.1	0.0	8.2	0.6	0.0	0.2	0.8	11.5	0.4	0.1	22.3	0.3
Cycle Q Clear(g_c), s	2.1	0.0	8.2	0.6	0.0	0.2	0.8	11.5	0.4	0.1	22.3	0.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	345	268	228	275	222	188	233	806	685	374	764	649
V/C Ratio(X)	0.18	0.00	0.82	0.06	0.00	0.02	0.15	0.52	0.02	0.01	0.84	0.02
Avail Cap(c_a), veh/h	496	413	351	471	413	351	407	825	702	588	825	702
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.9	0.0	27.4	24.8	0.0	25.5	13.5	12.6	9.6	11.0	16.6	10.5
Incr Delay (d2), s/veh	0.2	0.0	8.4	0.1	0.0	0.0	0.3	0.6	0.0	0.0	7.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	3.9	0.3	0.0	0.1	0.4	5.5	0.2	0.0	12.2	0.1
LnGrp Delay(d),s/veh	24.2	0.0	35.7	24.9	0.0	25.6	13.8	13.1	9.6	11.0	24.2	10.5
LnGrp LOS	C		D	C		C	B	B	A	B	C	B
Approach Vol, veh/h	247						471		662			
Approach Delay, s/veh	32.9		25.0				13.1		23.8			
Approach LOS	C		C				B		C			
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.9	35.6	8.8	14.6	6.3	37.2	7.0	16.4				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	9.0	32.0	9.0	16.0	9.0	32.0	9.0	16.0				
Max Q Clear Time (g_c+I1), s	2.8	24.3	4.1	2.2	2.1	13.5	2.6	10.2				
Green Ext Time (p_c), s	0.0	5.4	0.0	0.0	0.0	7.1	0.0	0.3				
Intersection Summary												
HCM 2010 Ctrl Delay	21.8											
HCM 2010 LOS	C											










June 2019

D.6 2023 BUILD – ALTERNATIVE 2



HCM 2010 TWSC
1: Jedburg Road & Old Dairy Road

2023 Alt 2 Build Conditions
AM Peak Hour

Intersection												
Int Delay, s/veh	22.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	85	3	37	9	6	88	30	728	19	125	489	94
Future Vol, veh/h	85	3	37	9	6	88	30	728	19	125	489	94
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Yield	-	-	None	-	-	None
Storage Length	0	-	250	150	-	150	150	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	34	34	34	34	34	34	11	11	11	11	11	11
Mvmt Flow	89	3	39	9	6	93	32	766	20	132	515	99

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1279	1679	307	1363	1718	393	614	0	0	786	0	0
Stage 1	829	829	-	840	840	-	-	-	-	-	-	-
Stage 2	450	850	-	523	878	-	-	-	-	-	-	-
Critical Hdwy	8.18	7.18	7.58	8.18	7.18	7.58	4.32	-	-	4.32	-	-
Critical Hdwy Stg 1	7.18	6.18	-	7.18	6.18	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7.18	6.18	-	7.18	6.18	-	-	-	-	-	-	-
Follow-up Hdwy	3.84	4.34	3.64	3.84	4.34	3.64	2.31	-	-	2.31	-	-
Pot Cap-1 Maneuver	94	68	603	80	64	524	903	-	-	773	-	-
Stage 1	270	316	-	266	312	-	-	-	-	-	-	-
Stage 2	481	308	-	431	298	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 60	54	603	61	51	524	903	-	-	773	-	-
Mov Cap-2 Maneuver	~ 60	54	-	61	51	-	-	-	-	-	-	-
Stage 1	261	262	-	257	301	-	-	-	-	-	-	-
Stage 2	374	297	-	330	247	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	280.6		22.9		0.4		1.9	
HCM LOS	F		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	903	-	-	60	342	61	51	524	773	-	-
HCM Lane V/C Ratio	0.035	-	-	1.491	0.123	0.155	0.124	0.177	0.17	-	-
HCM Control Delay (s)	9.1	-	-	\$ 404.6	17	74.6	85.3	13.3	10.6	-	-
HCM Lane LOS	A	-	-	F	C	F	F	B	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	7.9	0.4	0.5	0.4	0.6	0.6	-	-

Notes											
-: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined				*: All major volume in platoon			

HCM 2010 Signalized Intersection Summary

2: Jedburg Road & I-26 EB Ramps

2023 Alt 2 Build Conditions

AM Peak Hour


















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	0	123	0	0	0	0	315	586	278	585	0
Future Volume (veh/h)	22	0	123	0	0	0	0	315	586	278	585	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1473	1473				0	1712	1712	1712	1712	0
Adj Flow Rate, veh/h	23	0	129				0	332	617	293	616	0
Adj No. of Lanes	0	1	1				0	2	1	1	2	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	29	29	29				0	11	11	11	11	0
Cap, veh/h	179	0	160				0	1628	728	527	2275	0
Arrive On Green	0.13	0.00	0.13				0.00	0.50	0.50	0.11	0.70	0.00
Sat Flow, veh/h	1403	0	1252				0	3338	1455	1630	3338	0
Grp Volume(v), veh/h	23	0	129				0	332	617	293	616	0
Grp Sat Flow(s),veh/h/ln	1403	0	1252				0	1626	1455	1630	1626	0
Q Serve(g_s), s	1.0	0.0	7.0				0.0	3.9	25.5	5.4	4.9	0.0
Cycle Q Clear(g_c), s	1.0	0.0	7.0				0.0	3.9	25.5	5.4	4.9	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	179	0	160				0	1628	728	527	2275	0
V/C Ratio(X)	0.13	0.00	0.81				0.00	0.20	0.85	0.56	0.27	0.00
Avail Cap(c_a), veh/h	323	0	289				0	2062	922	626	2905	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	26.9	0.0	29.5				0.0	9.6	15.0	6.0	3.9	0.0
Incr Delay (d2), s/veh	0.3	0.0	9.3				0.0	0.1	6.0	0.9	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	2.8				0.0	1.8	11.3	2.5	2.2	0.0
LnGrp Delay(d),s/veh	27.2	0.0	38.7				0.0	9.7	21.1	6.9	3.9	0.0
LnGrp LOS	C		D					A	C	A	A	
Approach Vol, veh/h		152						949			909	
Approach Delay, s/veh		37.0						17.1			4.9	
Approach LOS		D						B			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	13.8	40.8		14.8		54.6						
Change Period (Y+Rc), s	6.0	6.0		6.0		6.0						
Max Green Setting (Gmax), s	12.0	44.0		16.0		62.0						
Max Q Clear Time (g_c+I1), s	7.4	27.5		9.0		6.9						
Green Ext Time (p_c), s	0.4	7.2		0.4		17.8						
Intersection Summary												
HCM 2010 Ctrl Delay			13.1									
HCM 2010 LOS			B									

HCM 2010 Signalized Intersection Summary

3: Jedburg Road & I-26 WB Ramps










2023 Alt 2 Build Conditions

AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	0	152	66	271	0	0	547	85
Future Volume (veh/h)	0	0	0	0	0	152	66	271	0	0	547	85
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				0	0	1727	1712	1712	0	0	1712	1712
Adj Flow Rate, veh/h				0	0	160	69	285	0	0	576	0
Adj No. of Lanes				0	0	1	1	2	0	0	2	1
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				0	0	10	11	11	0	0	11	11
Cap, veh/h				0	0	0	685	2660	0	0	1883	842
Arrive On Green				0.00	0.00	0.00	0.06	0.82	0.00	0.00	0.58	0.00
Sat Flow, veh/h					0		1630	3338	0	0	3338	1455
Grp Volume(v), veh/h					0.0		69	285	0	0	576	0
Grp Sat Flow(s),veh/h/ln							1630	1626	0	0	1626	1455
Q Serve(g_s), s							0.4	0.6	0.0	0.0	3.0	0.0
Cycle Q Clear(g_c), s							0.4	0.6	0.0	0.0	3.0	0.0
Prop In Lane							1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h							685	2660	0	0	1883	842
V/C Ratio(X)							0.10	0.11	0.00	0.00	0.31	0.00
Avail Cap(c_a), veh/h							1285	6121	0	0	4146	1855
HCM Platoon Ratio							1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)							1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh							2.0	0.6	0.0	0.0	3.5	0.0
Incr Delay (d2), s/veh							0.1	0.0	0.0	0.0	0.1	0.0
Initial Q Delay(d3),s/veh							0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln							0.2	0.2	0.0	0.0	1.3	0.0
LnGrp Delay(d),s/veh							2.1	0.6	0.0	0.0	3.6	0.0
LnGrp LOS							A	A			A	
Approach Vol, veh/h								354			576	
Approach Delay, s/veh								0.9			3.6	
Approach LOS								A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6						
Phs Duration (G+Y+Rc), s		32.9			7.9	25.1						
Change Period (Y+Rc), s		6.0			6.0	6.0						
Max Green Setting (Gmax), s		62.0			14.0	42.0						
Max Q Clear Time (g_c+I1), s		2.6			2.4	5.0						
Green Ext Time (p_c), s		7.2			0.1	14.1						
Intersection Summary												
HCM 2010 Ctrl Delay			2.6									
HCM 2010 LOS			A									

HCM 2010 TWSC
4: Jedburg Road & Drop Off Drive

2023 Alt 2 Build Conditions
AM Peak Hour

Intersection												
Int Delay, s/veh	4.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	33	9	94	49	14	14	55	305	63	18	489	55
Future Vol, veh/h	33	9	94	49	14	14	55	305	63	18	489	55
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	175	-	-	200	-	200	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	22	22	22	22	22	22	11	11	11	11	11	11
Mvmt Flow	35	10	100	52	15	15	59	324	67	19	520	59

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	876	1097	290	745	1059	162	579	0	0	391	0	0
Stage 1	588	588	-	442	442	-	-	-	-	-	-	-
Stage 2	288	509	-	303	617	-	-	-	-	-	-	-
Critical Hdwy	7.94	6.94	7.34	7.94	6.94	7.34	4.32	-	-	4.32	-	-
Critical Hdwy Stg 1	6.94	5.94	-	6.94	5.94	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.94	5.94	-	6.94	5.94	-	-	-	-	-	-	-
Follow-up Hdwy	3.72	4.22	3.52	3.72	4.22	3.52	2.31	-	-	2.31	-	-
Pot Cap-1 Maneuver	213	183	650	268	193	795	931	-	-	1102	-	-
Stage 1	416	447	-	514	527	-	-	-	-	-	-	-
Stage 2	642	489	-	628	433	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	184	169	650	204	178	795	931	-	-	1102	-	-
Mov Cap-2 Maneuver	184	169	-	204	178	-	-	-	-	-	-	-
Stage 1	390	439	-	482	494	-	-	-	-	-	-	-
Stage 2	572	458	-	511	426	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	17.4		25		1.2		0.3	
HCM LOS	C		D					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	931	-	-	184	521	204	291	1102	-	-
HCM Lane V/C Ratio	0.063	-	-	0.191	0.21	0.256	0.102	0.017	-	-
HCM Control Delay (s)	9.1	-	-	29.1	13.7	28.6	18.8	8.3	-	-
HCM Lane LOS	A	-	-	D	B	D	C	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.7	0.8	1	0.3	0.1	-	-

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕		↖	↗			↗	↖
Traffic Vol, veh/h	0	0	0	2	0	0	95	414	1	0	359	20
Future Vol, veh/h	0	0	0	2	0	0	95	414	1	0	359	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	-	-	-	-	0	-	-	-	-	150
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	25	25	25	25	25	25	16	16	16	16	16	16
Mvmt Flow	0	0	0	2	0	0	101	440	1	0	382	21
Major/Minor				Minor1		Major1		Major2				
Conflicting Flow All				834	1025	221	382	0	0	-	-	0
Stage 1				643	643	-	-	-	-	-	-	-
Stage 2				191	382	-	-	-	-	-	-	-
Critical Hdwy				7.3	7	7.4	4.42	-	-	-	-	-
Critical Hdwy Stg 1				6.3	6	-	-	-	-	-	-	-
Critical Hdwy Stg 2				6.3	6	-	-	-	-	-	-	-
Follow-up Hdwy				3.75	4.25	3.55	2.36	-	-	-	-	-
Pot Cap-1 Maneuver				265	199	717	1079	-	-	0	-	0
Stage 1				428	414	-	-	-	-	0	-	0
Stage 2				758	557	-	-	-	-	0	-	0
Platoon blocked, %								-	-		-	
Mov Cap-1 Maneuver				240	0	717	1079	-	-	-	-	-
Mov Cap-2 Maneuver				240	0	-	-	-	-	-	-	-
Stage 1				388	0	-	-	-	-	-	-	-
Stage 2				758	0	-	-	-	-	-	-	-
Approach				WB		NB		SB				
HCM Control Delay, s				20.1		1.6		0				
HCM LOS				C								
Minor Lane/Major Mvmt		NBL	NBT	NBRWBLn1		SBT						
Capacity (veh/h)		1079	-	-	240	-						
HCM Lane V/C Ratio		0.094	-	-	0.009	-						
HCM Control Delay (s)		8.7	-	-	20.1	-						
HCM Lane LOS		A	-	-	C	-						
HCM 95th %tile Q(veh)		0.3	-	-	0	-						

HCM 2010 TWSC
8: I-26 EB Ramp & SC 27




2023 Alt 2 Build Conditions
AM Peak Hour

Intersection												
Int Delay, s/veh	2.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑						↑↑	↑	↑	↑↑	
Traffic Vol, veh/h	0	0	0	0	0	0	0	272	258	249	367	0
Future Vol, veh/h	0	0	0	0	0	0	0	272	258	249	367	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Free	-	-	None
Storage Length	-	-	-	-	-	-	-	-	100	0	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	23	23	23	23	23	23	16	16	16	16	16	16
Mvmt Flow	0	0	0	0	0	0	0	299	284	274	403	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	1250	-	-	0	- 299 0 0
Stage 1	-	951	-	-	-	- - -
Stage 2	-	299	-	-	-	- - -
Critical Hdwy	-	6.96	-	-	-	4.42 - -
Critical Hdwy Stg 1	-	5.96	-	-	-	- - -
Critical Hdwy Stg 2	-	5.96	-	-	-	- - -
Follow-up Hdwy	-	4.23	-	-	-	2.36 - -
Pot Cap-1 Maneuver	0	145	0	0	- 0	1164 - 0
Stage 1	0	293	0	0	- 0	- - 0
Stage 2	0	615	0	0	- 0	- - 0
Platoon blocked, %					-	-
Mov Cap-1 Maneuver	-	0	-	-	-	1164 - -
Mov Cap-2 Maneuver	-	0	-	-	-	- - -
Stage 1	-	0	-	-	-	- - -
Stage 2	-	0	-	-	-	- - -

Approach	EB	NB	SB
HCM Control Delay, s	0	0	3.7
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	EBLn1	SBL	SBT
Capacity (veh/h)	-	-	1164	-
HCM Lane V/C Ratio	-	-	0.235	-
HCM Control Delay (s)	-	0	9	-
HCM Lane LOS	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0.9	-

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	5	525	1	1	362
Future Vol, veh/h	2	5	525	1	1	362
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	16	16	16	16
Mvmt Flow	2	5	577	1	1	398
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	779	289	0	0	578	0
Stage 1	578	-	-	-	-	-
Stage 2	201	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.42	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.36	-
Pot Cap-1 Maneuver	333	708	-	-	901	-
Stage 1	524	-	-	-	-	-
Stage 2	813	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	333	708	-	-	901	-
Mov Cap-2 Maneuver	333	-	-	-	-	-
Stage 1	524	-	-	-	-	-
Stage 2	812	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	11.8	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	-		536	901	
HCM Lane V/C Ratio	-	-		0.014	0.001	
HCM Control Delay (s)	-	-		11.8	9	
HCM Lane LOS	-	-		B	A	
HCM 95th %tile Q(veh)	-	-		0	0	

Intersection												
Int Delay, s/veh	2.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	6	26	33	3	16	8	174	39	14	112	1
Future Vol, veh/h	6	6	26	33	3	16	8	174	39	14	112	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	23	23	23	23	23	23	36	36	36	36	36	36
Mvmt Flow	7	7	29	37	3	18	9	193	43	16	124	1

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	400	411	125	408	390	215	125	0	0	236	0	0
Stage 1	157	157	-	233	233	-	-	-	-	-	-	-
Stage 2	243	254	-	175	157	-	-	-	-	-	-	-
Critical Hdwy	7.33	6.73	6.43	7.33	6.73	6.43	4.46	-	-	4.46	-	-
Critical Hdwy Stg 1	6.33	5.73	-	6.33	5.73	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.33	5.73	-	6.33	5.73	-	-	-	-	-	-	-
Follow-up Hdwy	3.707	4.207	3.507	3.707	4.207	3.507	2.524	-	-	2.524	-	-
Pot Cap-1 Maneuver	525	500	872	518	514	775	1276	-	-	1155	-	-
Stage 1	798	730	-	725	675	-	-	-	-	-	-	-
Stage 2	716	660	-	780	730	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	501	489	872	487	502	775	1276	-	-	1155	-	-
Mov Cap-2 Maneuver	501	489	-	487	502	-	-	-	-	-	-	-
Stage 1	792	719	-	719	670	-	-	-	-	-	-	-
Stage 2	691	655	-	736	719	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	10.4		12.3		0.3		0.9	
HCM LOS	B		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1276	-	-	703	551	1155	-
HCM Lane V/C Ratio	0.007	-	-	0.06	0.105	0.013	-
HCM Control Delay (s)	7.8	0	-	10.4	12.3	8.2	0
HCM Lane LOS	A	A	-	B	B	A	A
HCM 95th %tile Q(veh)	0	-	-	0.2	0.3	0	-

Intersection												
Int Delay, s/veh	4.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔			↔			↔	
Traffic Vol, veh/h	0	0	0	60	2	99	27	122	0	0	146	25
Future Vol, veh/h	0	0	0	60	2	99	27	122	0	0	146	25
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	46	46	46	46	46	46	36	36	36	36	36	36
Mvmt Flow	0	0	0	64	2	105	29	130	0	0	155	27

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	357	370	130	182	0	-
Stage 1	188	188	-	-	-	-
Stage 2	169	182	-	-	-	-
Critical Hdwy	6.86	6.96	6.66	4.46	-	-
Critical Hdwy Stg 1	5.86	5.96	-	-	-	-
Critical Hdwy Stg 2	5.86	5.96	-	-	-	-
Follow-up Hdwy	3.914	4.414	3.714	2.524	-	-
Pot Cap-1 Maneuver	562	496	814	1213	-	0
Stage 1	749	669	-	-	-	0
Stage 2	765	673	-	-	-	0
Platoon blocked, %					-	-
Mov Cap-1 Maneuver	547	0	814	1213	-	-
Mov Cap-2 Maneuver	547	0	-	-	-	-
Stage 1	730	0	-	-	-	-
Stage 2	765	0	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12	1.5	0
HCM LOS	B		




Minor Lane/Major Mvmt	NBL	NBTWBLn1	SBT	SBR
Capacity (veh/h)	1213	-	687	-
HCM Lane V/C Ratio	0.024	-	0.249	-
HCM Control Delay (s)	8	0	12	-
HCM Lane LOS	A	A	B	-
HCM 95th %tile Q(veh)	0.1	-	1	-

Intersection												
Int Delay, s/veh	2.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Traffic Vol, veh/h	28	2	25	0	0	0	0	121	69	71	135	0
Future Vol, veh/h	28	2	25	0	0	0	0	121	69	71	135	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	53	53	53	53	53	53	36	36	36	36	36	36
Mvmt Flow	31	2	28	0	0	0	0	134	77	79	150	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	481	519	150	-	0	0	211	0	0
Stage 1	308	308	-	-	-	-	-	-	-
Stage 2	173	211	-	-	-	-	-	-	-
Critical Hdwy	6.93	7.03	6.73	-	-	-	4.46	-	-
Critical Hdwy Stg 1	5.93	6.03	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.93	6.03	-	-	-	-	-	-	-
Follow-up Hdwy	3.977	4.477	3.777	-	-	-	2.524	-	-
Pot Cap-1 Maneuver	462	396	778	0	-	-	1181	-	0
Stage 1	643	578	-	0	-	-	-	-	0
Stage 2	748	642	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	428	0	778	-	-	-	1181	-	-
Mov Cap-2 Maneuver	428	0	-	-	-	-	-	-	-
Stage 1	643	0	-	-	-	-	-	-	-
Stage 2	693	0	-	-	-	-	-	-	-

























Approach	EB	NB	SB
HCM Control Delay, s	12.5	0	2.8
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	SBL	SBT
Capacity (veh/h)	-	-	543	1181	-
HCM Lane V/C Ratio	-	-	0.113	0.067	-
HCM Control Delay (s)	-	-	12.5	8.3	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.4	0.2	-

Intersection						
Int Delay, s/veh	5.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	68	84	56	122	112	47
Future Vol, veh/h	68	84	56	122	112	47
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	19	19	36	36	36	36
Mvmt Flow	75	92	62	134	123	52
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	196	0	-	0	371	129
Stage 1	-	-	-	-	129	-
Stage 2	-	-	-	-	242	-
Critical Hdwy	4.29	-	-	-	6.76	6.56
Critical Hdwy Stg 1	-	-	-	-	5.76	-
Critical Hdwy Stg 2	-	-	-	-	5.76	-
Follow-up Hdwy	2.371	-	-	-	3.824	3.624
Pot Cap-1 Maneuver	1281	-	-	-	568	837
Stage 1	-	-	-	-	820	-
Stage 2	-	-	-	-	725	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1281	-	-	-	533	837
Mov Cap-2 Maneuver	-	-	-	-	533	-
Stage 1	-	-	-	-	769	-
Stage 2	-	-	-	-	725	-
Approach	EB	WB		SB		
HCM Control Delay, s	3.6	0		13.5		
HCM LOS				B		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1281	-	-	-	597	
HCM Lane V/C Ratio	0.058	-	-	-	0.293	
HCM Control Delay (s)	8	0	-	-	13.5	
HCM Lane LOS	A	A	-	-	B	
HCM 95th %tile Q(veh)	0.2	-	-	-	1.2	










HCM 2010 Signalized Intersection Summary
15: Volvo Car Drive & Welcome Center/Factory Entrance

2023 Alt 2 Build Conditions
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	0	11	24	0	11	76	197	219	72	77	26
Future Volume (veh/h)	3	0	11	24	0	11	76	197	219	72	77	26
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727
Adj Flow Rate, veh/h	3	0	12	26	0	12	83	214	238	78	84	28
Adj No. of Lanes	1	1	1	1	1	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	10	10	10	10	10	10	10	10	10	10	10	10
Cap, veh/h	226	45	38	263	83	70	555	458	390	424	454	386
Arrive On Green	0.00	0.00	0.03	0.03	0.00	0.05	0.06	0.27	0.27	0.06	0.26	0.26
Sat Flow, veh/h	1645	1727	1468	1645	1727	1468	1645	1727	1468	1645	1727	1468
Grp Volume(v), veh/h	3	0	12	26	0	12	83	214	238	78	84	28
Grp Sat Flow(s),veh/h/ln	1645	1727	1468	1645	1727	1468	1645	1727	1468	1645	1727	1468
Q Serve(g_s), s	0.1	0.0	0.3	0.6	0.0	0.3	1.4	4.0	5.5	1.3	1.4	0.6
Cycle Q Clear(g_c), s	0.1	0.0	0.3	0.6	0.0	0.3	1.4	4.0	5.5	1.3	1.4	0.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	226	45	38	263	83	70	555	458	390	424	454	386
V/C Ratio(X)	0.01	0.00	0.31	0.10	0.00	0.17	0.15	0.47	0.61	0.18	0.18	0.07
Avail Cap(c_a), veh/h	606	719	611	606	719	611	839	764	649	713	764	649
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.1	0.0	18.4	17.6	0.0	17.6	9.3	11.8	12.4	9.5	11.0	10.6
Incr Delay (d2), s/veh	0.0	0.0	4.6	0.2	0.0	1.1	0.1	0.7	1.6	0.2	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.2	0.3	0.0	0.1	0.6	2.0	2.4	0.6	0.7	0.2
LnGrp Delay(d),s/veh	18.2	0.0	23.0	17.7	0.0	18.7	9.4	12.6	13.9	9.7	11.2	10.7
LnGrp LOS	B		C	B		B	A	B	B	A	B	B
Approach Vol, veh/h	15		38				535				190	
Approach Delay, s/veh	22.0		18.0				12.7				10.5	
Approach LOS	C		B				B				B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.4	16.1	6.1	7.8	8.3	16.2	7.0	7.0				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	9.0	17.0	9.0	16.0	9.0	17.0	9.0	16.0				
Max Q Clear Time (g_c+I1), s	3.4	3.4	2.1	2.3	3.3	7.5	2.6	2.3				
Green Ext Time (p_c), s	0.1	0.9	0.0	0.0	0.1	2.7	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay	12.6											
HCM 2010 LOS	B											

HCM 2010 TWSC
1: Jedburg Road & Old Dairy Road

2023 Alt 2 Build Conditions
PM Peak Hour

Intersection												
Int Delay, s/veh	29.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	69	8	56	11	11	160	29	633	24	103	769	115
Future Vol, veh/h	69	8	56	11	11	160	29	633	24	103	769	115
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Yield	-	-	None	-	-	None
Storage Length	0	-	250	150	-	150	150	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	9	9	9	9	9	9	7	7	7	7	7	7
Mvmt Flow	76	9	62	12	12	176	32	696	26	113	845	126

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1552	1920	486	1426	1970	361	971	0	0	722	0	0
Stage 1	1134	1134	-	773	773	-	-	-	-	-	-	-
Stage 2	418	786	-	653	1197	-	-	-	-	-	-	-
Critical Hdwy	7.68	6.68	7.08	7.68	6.68	7.08	4.24	-	-	4.24	-	-
Critical Hdwy Stg 1	6.68	5.68	-	6.68	5.68	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.68	5.68	-	6.68	5.68	-	-	-	-	-	-	-
Follow-up Hdwy	3.59	4.09	3.39	3.59	4.09	3.39	2.27	-	-	2.27	-	-
Pot Cap-1 Maneuver	~ 72	61	509	90	57	616	676	-	-	844	-	-
Stage 1	204	262	-	343	391	-	-	-	-	-	-	-
Stage 2	565	385	-	406	244	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 36	50	509	59	47	616	676	-	-	844	-	-
Mov Cap-2 Maneuver	~ 36	50	-	59	47	-	-	-	-	-	-	-
Stage 1	194	227	-	327	373	-	-	-	-	-	-	-
Stage 2	372	367	-	297	211	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s\$	401.7		22.9		0.4		1	
HCM LOS	F		C					


Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	676	-	-	36	237	59	47	616	844	-	-
HCM Lane V/C Ratio	0.047	-	-	2.106	0.297	0.205	0.257	0.285	0.134	-	-
HCM Control Delay (s)	10.6	-	-	\$ 749.8	26.5	81.1	106.3	13.2	9.9	-	-
HCM Lane LOS	B	-	-	F	D	F	F	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	8.4	1.2	0.7	0.9	1.2	0.5	-	-

Notes												
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon						

HCM 2010 Signalized Intersection Summary

2: Jedburg Road & I-26 EB Ramps


















2023 Alt 2 Build Conditions
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↩	↩					↩↩	↩	↩	↩↩	
Traffic Volume (veh/h)	58	2	98	0	0	0	0	372	490	152	889	0
Future Volume (veh/h)	58	2	98	0	0	0	0	372	490	152	889	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1597	1597				0	1776	1776	1776	1776	0
Adj Flow Rate, veh/h	61	2	103				0	392	516	160	936	0
Adj No. of Lanes	0	1	1				0	2	1	1	2	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	19	19	19				0	7	7	7	7	0
Cap, veh/h	168	6	155				0	1674	749	502	2279	0
Arrive On Green	0.11	0.11	0.11				0.00	0.50	0.50	0.07	0.68	0.00
Sat Flow, veh/h	1475	48	1357				0	3463	1509	1691	3463	0
Grp Volume(v), veh/h	63	0	103				0	392	516	160	936	0
Grp Sat Flow(s),veh/h/ln	1523	0	1357				0	1687	1509	1691	1687	0
Q Serve(g_s), s	2.2	0.0	4.1				0.0	3.8	14.9	2.4	7.1	0.0
Cycle Q Clear(g_c), s	2.2	0.0	4.1				0.0	3.8	14.9	2.4	7.1	0.0
Prop In Lane	0.97		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	174	0	155				0	1674	749	502	2279	0
V/C Ratio(X)	0.36	0.00	0.67				0.00	0.23	0.69	0.32	0.41	0.00
Avail Cap(c_a), veh/h	427	0	381				0	2604	1165	733	3669	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	23.3	0.0	24.2				0.0	8.2	11.0	5.3	4.2	0.0
Incr Delay (d2), s/veh	1.3	0.0	4.8				0.0	0.1	1.1	0.4	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	1.8				0.0	1.8	6.4	1.1	3.3	0.0
LnGrp Delay(d),s/veh	24.6	0.0	29.1				0.0	8.3	12.1	5.7	4.3	0.0
LnGrp LOS	C		C					A	B	A	A	
Approach Vol, veh/h		166						908			1096	
Approach Delay, s/veh		27.4						10.5			4.5	
Approach LOS		C						B			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	10.2	34.3		12.5		44.5						
Change Period (Y+Rc), s	6.0	6.0		6.0		6.0						
Max Green Setting (Gmax), s	12.0	44.0		16.0		62.0						
Max Q Clear Time (g_c+I1), s	4.4	16.9		6.1		9.1						
Green Ext Time (p_c), s	0.2	9.8		0.9		29.4						
Intersection Summary												
HCM 2010 Ctrl Delay			8.7									
HCM 2010 LOS			A									

HCM 2010 Signalized Intersection Summary










3: Jedburg Road & I-26 WB Ramps

2023 Alt 2 Build Conditions
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	0	277	84	346	0	0	414	71
Future Volume (veh/h)	0	0	0	0	0	277	84	346	0	0	414	71
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				0	0	1792	1776	1776	0	0	1776	1776
Adj Flow Rate, veh/h				0	0	292	88	364	0	0	436	0
Adj No. of Lanes				0	0	1	1	2	0	0	2	1
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				0	0	6	7	7	0	0	7	7
Cap, veh/h				0	0	0	766	2663	0	0	1715	767
Arrive On Green				0.00	0.00	0.00	0.07	0.79	0.00	0.00	0.51	0.00
Sat Flow, veh/h						0	1691	3463	0	0	3463	1509
Grp Volume(v), veh/h					0.0		88	364	0	0	436	0
Grp Sat Flow(s),veh/h/ln							1691	1687	0	0	1687	1509
Q Serve(g_s), s							0.5	0.7	0.0	0.0	2.1	0.0
Cycle Q Clear(g_c), s							0.5	0.7	0.0	0.0	2.1	0.0
Prop In Lane							1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h							766	2663	0	0	1715	767
V/C Ratio(X)							0.11	0.14	0.00	0.00	0.25	0.00
Avail Cap(c_a), veh/h							1478	7344	0	0	4975	2226
HCM Platoon Ratio							1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)							1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh							2.2	0.7	0.0	0.0	4.0	0.0
Incr Delay (d2), s/veh							0.1	0.0	0.0	0.0	0.1	0.0
Initial Q Delay(d3),s/veh							0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln							0.2	0.3	0.0	0.0	1.0	0.0
LnGrp Delay(d),s/veh							2.2	0.7	0.0	0.0	4.0	0.0
LnGrp LOS							A	A			A	
Approach Vol, veh/h								452			436	
Approach Delay, s/veh								1.0			4.0	
Approach LOS								A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6						
Phs Duration (G+Y+Rc), s		28.5			8.0	20.5						
Change Period (Y+Rc), s		6.0			6.0	6.0						
Max Green Setting (Gmax), s		62.0			14.0	42.0						
Max Q Clear Time (g_c+I1), s		2.7			2.5	4.1						
Green Ext Time (p_c), s		9.6			0.1	10.4						
Intersection Summary												
HCM 2010 Ctrl Delay				2.5								
HCM 2010 LOS				A								

HCM 2010 TWSC
4: Jedburg Road & Drop Off Drive

2023 Alt 2 Build Conditions
PM Peak Hour




Intersection												
Int Delay, s/veh	4.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	28	8	82	69	8	26	71	507	45	14	334	59
Future Vol, veh/h	28	8	82	69	8	26	71	507	45	14	334	59
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	175	-	-	200	-	200	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	8	8	8	8	8	8	7	7	7	7	7	7
Mvmt Flow	30	9	88	74	9	28	76	545	48	15	359	63
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	850	1166	211	911	1149	273	422	0	0	593	0	0
Stage 1	421	421	-	697	697	-	-	-	-	-	-	-
Stage 2	429	745	-	214	452	-	-	-	-	-	-	-
Critical Hdwy	7.66	6.66	7.06	7.66	6.66	7.06	4.24	-	-	4.24	-	-
Critical Hdwy Stg 1	6.66	5.66	-	6.66	5.66	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.66	5.66	-	6.66	5.66	-	-	-	-	-	-	-
Follow-up Hdwy	3.58	4.08	3.38	3.58	4.08	3.38	2.27	-	-	2.27	-	-
Pot Cap-1 Maneuver	244	184	776	220	188	707	1099	-	-	945	-	-
Stage 1	565	572	-	384	427	-	-	-	-	-	-	-
Stage 2	559	405	-	751	554	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	211	169	776	176	172	707	1099	-	-	945	-	-
Mov Cap-2 Maneuver	211	169	-	176	172	-	-	-	-	-	-	-
Stage 1	526	563	-	358	398	-	-	-	-	-	-	-
Stage 2	489	377	-	645	545	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	15.3		31.4		1		0.3					
HCM LOS	C		D									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR		
Capacity (veh/h)	1099	-	-	211	588	176	408	945	-	-		
HCM Lane V/C Ratio	0.069	-	-	0.143	0.165	0.422	0.09	0.016	-	-		
HCM Control Delay (s)	8.5	-	-	24.9	12.3	39.6	14.7	8.9	-	-		
HCM Lane LOS	A	-	-	C	B	E	B	A	-	-		
HCM 95th %tile Q(veh)	0.2	-	-	0.5	0.6	1.9	0.3	0	-	-		

Intersection												
Int Delay, s/veh	0.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕		↕	↕			↕	↕
Traffic Vol, veh/h	0	0	0	0	7	1	90	451	4	0	522	63
Future Vol, veh/h	0	0	0	0	7	1	90	451	4	0	522	63
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	-	-	-	-	0	-	-	-	-	150
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	7	7	7	7	7	7	7	7	7	7	7	7
Mvmt Flow	0	0	0	0	8	1	100	501	4	0	580	70
Major/Minor												
Minor1				Major1				Major2				
Conflicting Flow All	993	1283	253	580	0	0	-	-	-	-	0	
Stage 1	703	703	-	-	-	-	-	-	-	-	-	
Stage 2	290	580	-	-	-	-	-	-	-	-	-	
Critical Hdwy	6.94	6.64	7.04	4.24	-	-	-	-	-	-	-	
Critical Hdwy Stg 1	5.94	5.64	-	-	-	-	-	-	-	-	-	
Critical Hdwy Stg 2	5.94	5.64	-	-	-	-	-	-	-	-	-	
Follow-up Hdwy	3.57	4.07	3.37	2.27	-	-	-	-	-	-	-	
Pot Cap-1 Maneuver	234	157	732	956	-	-	0	-	0			
Stage 1	439	426	-	-	-	-	0	-	0			
Stage 2	719	486	-	-	-	-	0	-	0			
Platoon blocked, %					-	-	-	-	-			
Mov Cap-1 Maneuver	209	0	732	956	-	-	-	-	-	-	-	
Mov Cap-2 Maneuver	209	0	-	-	-	-	-	-	-	-	-	
Stage 1	393	0	-	-	-	-	-	-	-	-	-	
Stage 2	719	0	-	-	-	-	-	-	-	-	-	
Approach												
WB				NB				SB				
HCM Control Delay, s	10			1.5				0				
HCM LOS	B											
Minor Lane/Major Mvmt												
NBL				NBT				NBRWBLn1				
Capacity (veh/h)	956	-	-	732	-							
HCM Lane V/C Ratio	0.105	-	-	0.012	-							
HCM Control Delay (s)	9.2	-	-	10	-							
HCM Lane LOS	A	-	-	B	-							
HCM 95th %tile Q(veh)	0.3	-	-	0	-							

HCM 2010 TWSC
8: I-26 EB Ramp & SC 27

2023 Alt 2 Build Conditions
PM Peak Hour

Intersection												
Int Delay, s/veh	2.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑						↑↑	↑	↑	↑↑	
Traffic Vol, veh/h	0	0	0	0	0	0	0	234	176	343	509	0
Future Vol, veh/h	0	0	0	0	0	0	0	234	176	343	509	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Free	-	-	None
Storage Length	-	-	-	-	-	-	-	-	100	0	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	8	8	8	8	8	8	7	7	7	7	7	7
Mvmt Flow	0	0	0	0	0	0	0	260	196	381	566	0
Major/Minor	Minor2						Major1			Major2		
Conflicting Flow All	-	1588	-				-	0	-	260	0	0
Stage 1	-	1328	-				-	-	-	-	-	-
Stage 2	-	260	-				-	-	-	-	-	-
Critical Hdwy	-	6.66	-				-	-	-	4.24	-	-
Critical Hdwy Stg 1	-	5.66	-				-	-	-	-	-	-
Critical Hdwy Stg 2	-	5.66	-				-	-	-	-	-	-
Follow-up Hdwy	-	4.08	-				-	-	-	2.27	-	-
Pot Cap-1 Maneuver	0	101	0				0	-	0	1266	-	0
Stage 1	0	212	0				0	-	0	-	-	0
Stage 2	0	677	0				0	-	0	-	-	0
Platoon blocked, %								-			-	
Mov Cap-1 Maneuver	-	0	-				-	-	-	1266	-	-
Mov Cap-2 Maneuver	-	0	-				-	-	-	-	-	-
Stage 1	-	0	-				-	-	-	-	-	-
Stage 2	-	0	-				-	-	-	-	-	-
Approach	EB						NB			SB		
HCM Control Delay, s	0						0			3.6		
HCM LOS	A											
Minor Lane/Major Mvmt	NBT EBLn1		SBL	SBT								
Capacity (veh/h)	-		-	1266	-							
HCM Lane V/C Ratio	-		-	0.301	-							
HCM Control Delay (s)	-		0	9.1	-							
HCM Lane LOS	-		A	A	-							
HCM 95th %tile Q(veh)	-		-	1.3	-							

Intersection						
Int Delay, s/veh	0.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	4	4	406	8	9	500
Future Vol, veh/h	4	4	406	8	9	500
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	7	7	7	7
Mvmt Flow	4	4	432	9	10	532
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	723	221	0	0	441	0
Stage 1	437	-	-	-	-	-
Stage 2	286	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.24	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.27	-
Pot Cap-1 Maneuver	361	783	-	-	1081	-
Stage 1	619	-	-	-	-	-
Stage 2	737	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	356	783	-	-	1081	-
Mov Cap-2 Maneuver	356	-	-	-	-	-
Stage 1	619	-	-	-	-	-
Stage 2	727	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	12.5	0		0.2		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	489	1081	-	
HCM Lane V/C Ratio	-	-	0.017	0.009	-	
HCM Control Delay (s)	-	-	12.5	8.4	0.1	
HCM Lane LOS	-	-	B	A	A	
HCM 95th %tile Q(veh)	-	-	0.1	0	-	

Intersection												
Int Delay, s/veh	4.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		<div>↕</div>			<div>↕</div>			<div>↕</div>			<div>↕</div>	
Traffic Vol, veh/h	6	2	23	106	9	18	21	132	30	18	149	13
Future Vol, veh/h	6	2	23	106	9	18	21	132	30	18	149	13
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	8	8	8	8	8	8	24	24	24	24	24	24
Mvmt Flow	7	2	25	116	10	20	23	145	33	20	164	14
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	434	435	171	433	426	162	178	0	0	178	0	0
Stage 1	211	211	-	208	208	-	-	-	-	-	-	-
Stage 2	223	224	-	225	218	-	-	-	-	-	-	-
Critical Hdwy	7.18	6.58	6.28	7.18	6.58	6.28	4.34	-	-	4.34	-	-
Critical Hdwy Stg 1	6.18	5.58	-	6.18	5.58	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.18	5.58	-	6.18	5.58	-	-	-	-	-	-	-
Follow-up Hdwy	3.572	4.072	3.372	3.572	4.072	3.372	2.416	-	-	2.416	-	-
Pot Cap-1 Maneuver	522	505	857	523	511	867	1276	-	-	1276	-	-
Stage 1	778	717	-	780	719	-	-	-	-	-	-	-
Stage 2	766	707	-	764	712	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	488	486	857	492	492	867	1276	-	-	1276	-	-
Mov Cap-2 Maneuver	488	486	-	492	492	-	-	-	-	-	-	-
Stage 1	762	705	-	764	705	-	-	-	-	-	-	-
Stage 2	723	693	-	727	700	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	10.3		14.5		0.9		0.8					
HCM LOS	B		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1276	-	-	717	523	1276	-	-				
HCM Lane V/C Ratio	0.018	-	-	0.048	0.279	0.016	-	-				
HCM Control Delay (s)	7.9	0	-	10.3	14.5	7.9	0	-				
HCM Lane LOS	A	A	-	B	B	A	A	-				
HCM 95th %tile Q(veh)	0.1	-	-	0.1	1.1	0	-	-				




Intersection												
Int Delay, s/veh	4.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔			↔			↔	
Traffic Vol, veh/h	0	0	0	80	0	86	28	97	0	0	249	29
Future Vol, veh/h	0	0	0	80	0	86	28	97	0	0	249	29
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	21	21	21	21	21	21	24	24	24	24	24	24
Mvmt Flow	0	0	0	89	0	96	31	108	0	0	277	32
Major/Minor				Minor1		Major1		Major2				
Conflicting Flow All				463	479	108	309	0	-	-	-	0
Stage 1				170	170	-	-	-	-	-	-	-
Stage 2				293	309	-	-	-	-	-	-	-
Critical Hdwy				6.61	6.71	6.41	4.34	-	-	-	-	-
Critical Hdwy Stg 1				5.61	5.71	-	-	-	-	-	-	-
Critical Hdwy Stg 2				5.61	5.71	-	-	-	-	-	-	-
Follow-up Hdwy				3.689	4.189	3.489	2.416	-	-	-	-	-
Pot Cap-1 Maneuver				524	459	897	1137	-	0	0	-	-
Stage 1				816	723	-	-	-	0	0	-	-
Stage 2				716	627	-	-	-	0	0	-	-
Platoon blocked, %								-			-	-
Mov Cap-1 Maneuver				509	0	897	1137	-	-	-	-	-
Mov Cap-2 Maneuver				509	0	-	-	-	-	-	-	-
Stage 1				792	0	-	-	-	-	-	-	-
Stage 2				716	0	-	-	-	-	-	-	-
Approach				WB		NB		SB				
HCM Control Delay, s				12.6		1.8		0				
HCM LOS				B								
Minor Lane/Major Mvmt				NBL	NBTWBLn1	SBT	SBR					
Capacity (veh/h)				1137	-	656	-					
HCM Lane V/C Ratio				0.027	-	0.281	-					
HCM Control Delay (s)				8.3	0	12.6	-					
HCM Lane LOS				A	A	B	-					
HCM 95th %tile Q(veh)				0.1	-	1.2	-					

Intersection												
Int Delay, s/veh	2.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Traffic Vol, veh/h	11	0	20	0	0	0	0	114	56	107	222	0
Future Vol, veh/h	11	0	20	0	0	0	0	114	56	107	222	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	52	52	52	52	52	52	24	24	24	24	24	24
Mvmt Flow	12	0	22	0	0	0	0	127	62	119	247	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	643	674	247	-	0	0	189	0	0
Stage 1	485	485	-	-	-	-	-	-	-
Stage 2	158	189	-	-	-	-	-	-	-
Critical Hdwy	6.92	7.02	6.72	-	-	-	4.34	-	-
Critical Hdwy Stg 1	5.92	6.02	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.92	6.02	-	-	-	-	-	-	-
Follow-up Hdwy	3.968	4.468	3.768	-	-	-	2.416	-	-
Pot Cap-1 Maneuver	368	319	684	0	-	-	1263	-	0
Stage 1	528	477	-	0	-	-	-	-	0
Stage 2	762	659	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	328	0	684	-	-	-	1263	-	-
Mov Cap-2 Maneuver	328	0	-	-	-	-	-	-	-
Stage 1	528	0	-	-	-	-	-	-	-
Stage 2	679	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.8	0	2.6
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	SBL	SBT
Capacity (veh/h)	-	-	494	1263	-
HCM Lane V/C Ratio	-	-	0.07	0.094	-
HCM Control Delay (s)	-	-	12.8	8.1	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0.3	-

























Intersection						
Int Delay, s/veh	6.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	36	0	123	134	176	67
Future Vol, veh/h	36	0	123	134	176	67
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	6	6	24	24	24	24
Mvmt Flow	40	0	137	149	196	74
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	286	0	-	0	292	212
Stage 1	-	-	-	-	212	-
Stage 2	-	-	-	-	80	-
Critical Hdwy	4.16	-	-	-	6.64	6.44
Critical Hdwy Stg 1	-	-	-	-	5.64	-
Critical Hdwy Stg 2	-	-	-	-	5.64	-
Follow-up Hdwy	2.254	-	-	-	3.716	3.516
Pot Cap-1 Maneuver	1253	-	-	-	655	776
Stage 1	-	-	-	-	774	-
Stage 2	-	-	-	-	890	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1253	-	-	-	634	776
Mov Cap-2 Maneuver	-	-	-	-	634	-
Stage 1	-	-	-	-	749	-
Stage 2	-	-	-	-	890	-
Approach	EB	WB		SB		
HCM Control Delay, s	8	0		14		
HCM LOS				B		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1253	-	-	-	668	
HCM Lane V/C Ratio	0.032	-	-	-	0.404	
HCM Control Delay (s)	8	0	-	-	14	
HCM Lane LOS	A	A	-	-	B	
HCM 95th %tile Q(veh)	0.1	-	-	-	2	

HCM 2010 Signalized Intersection Summary

15: Volvo Car Drive & Welcome Center/Factory Entrance

2023 Alt 2 Build Conditions

PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	0	79	219	0	72	18	112	25	8	174	5
Future Volume (veh/h)	27	0	79	219	0	72	18	112	25	8	174	5
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727
Adj Flow Rate, veh/h	29	0	86	238	0	78	20	122	27	9	189	5
Adj No. of Lanes	1	1	1	1	1	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	10	10	10	10	10	10	10	10	10	10	10	10
Cap, veh/h	322	164	140	537	391	332	291	342	291	334	324	276
Arrive On Green	0.03	0.00	0.10	0.16	0.00	0.23	0.02	0.20	0.20	0.01	0.19	0.19
Sat Flow, veh/h	1645	1727	1468	1645	1727	1468	1645	1727	1468	1645	1727	1468
Grp Volume(v), veh/h	29	0	86	238	0	78	20	122	27	9	189	5
Grp Sat Flow(s),veh/h/ln	1645	1727	1468	1645	1727	1468	1645	1727	1468	1645	1727	1468
Q Serve(g_s), s	0.7	0.0	2.5	5.3	0.0	1.9	0.4	2.7	0.7	0.2	4.4	0.1
Cycle Q Clear(g_c), s	0.7	0.0	2.5	5.3	0.0	1.9	0.4	2.7	0.7	0.2	4.4	0.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	322	164	140	537	391	332	291	342	291	334	324	276
V/C Ratio(X)	0.09	0.00	0.62	0.44	0.00	0.23	0.07	0.36	0.09	0.03	0.58	0.02
Avail Cap(c_a), veh/h	610	621	528	609	621	528	591	659	561	651	659	561
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.5	0.0	19.4	13.0	0.0	14.1	14.4	15.4	14.6	14.5	16.5	14.7
Incr Delay (d2), s/veh	0.1	0.0	4.4	0.6	0.0	0.4	0.1	0.6	0.1	0.0	1.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	1.2	2.4	0.0	0.8	0.2	1.3	0.3	0.1	2.2	0.1
LnGrp Delay(d),s/veh	17.6	0.0	23.7	13.6	0.0	14.4	14.5	16.0	14.7	14.5	18.1	14.8
LnGrp LOS	B		C	B		B	B	B	B	B	B	B
Approach Vol, veh/h		115			316			169			203	
Approach Delay, s/veh		22.2			13.8			15.6			17.9	
Approach LOS		C			B			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.9	14.4	7.2	16.1	6.4	14.8	13.0	10.2				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	9.0	17.0	9.0	16.0	9.0	17.0	9.0	16.0				
Max Q Clear Time (g_c+I1), s	2.4	6.4	2.7	3.9	2.2	4.7	7.3	4.5				
Green Ext Time (p_c), s	0.0	1.9	0.0	0.1	0.0	1.3	0.1	0.2				
Intersection Summary												
HCM 2010 Ctrl Delay				16.4								
HCM 2010 LOS				B								










June 2019

D.7 2043 BUILD – ALTERNATIVE 2



HCM 2010 TWSC
1: Jedburg Road & Old Dairy Road

2043 Alt 2 Build Conditions
AM Peak Hour

Intersection												
Int Delay, s/veh	137.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	109	4	47	11	8	113	39	930	25	160	625	120
Future Vol, veh/h	109	4	47	11	8	113	39	930	25	160	625	120
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Yield	-	-	None	-	-	None
Storage Length	0	-	250	150	-	150	150	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	34	34	34	34	34	34	11	11	11	11	11	11
Mvmt Flow	115	4	49	12	8	119	41	979	26	168	658	126

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1633	2144	392	1741	2194	503	784	0	0	1005	0	0
Stage 1	1057	1057	-	1074	1074	-	-	-	-	-	-	-
Stage 2	576	1087	-	667	1120	-	-	-	-	-	-	-
Critical Hdwy	8.18	7.18	7.58	8.18	7.18	7.58	4.32	-	-	4.32	-	-
Critical Hdwy Stg 1	7.18	6.18	-	7.18	6.18	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7.18	6.18	-	7.18	6.18	-	-	-	-	-	-	-
Follow-up Hdwy	3.84	4.34	3.64	3.84	4.34	3.64	2.31	-	-	2.31	-	-
Pot Cap-1 Maneuver	~ 48	32	525	39	30	438	774	-	-	633	-	-
Stage 1	190	239	-	185	234	-	-	-	-	-	-	-
Stage 2	398	230	-	346	221	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 19	22	525	23	21	438	774	-	-	633	-	-
Mov Cap-2 Maneuver	~ 19	22	-	23	21	-	-	-	-	-	-	-
Stage 1	180	176	-	175	222	-	-	-	-	-	-	-
Stage 2	264	218	-	225	162	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, \$ 1828.9		52.3	0.4	2.3
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	774	-	-	19	188	23	21	438	633	-	-
HCM Lane V/C Ratio	0.053	-	-	6.039	0.286	0.503	0.401	0.272	0.266	-	-
HCM Control Delay (s)	9.9	-	-	\$ 2669.9	31.6	268.8	263.2	16.3	12.7	-	-
HCM Lane LOS	A	-	-	F	D	F	F	C	B	-	-
HCM 95th %tile Q(veh)	0.2	-	-	14.9	1.1	1.5	1.2	1.1	1.1	-	-








Notes											
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined				*: All major volume in platoon			

HCM 2010 Signalized Intersection Summary

2: Jedburg Road & I-26 EB Ramps

2043 Alt 2 Build Conditions

AM Peak Hour


















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	28	0	157	0	0	0	0	403	749	356	748	0
Future Volume (veh/h)	28	0	157	0	0	0	0	403	749	356	748	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1473	1473				0	1712	1712	1712	1712	0
Adj Flow Rate, veh/h	29	0	165				0	424	788	375	787	0
Adj No. of Lanes	0	1	1				0	2	1	1	2	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	29	29	29				0	11	11	11	11	0
Cap, veh/h	215	0	192				0	1662	743	475	2300	0
Arrive On Green	0.15	0.00	0.15				0.00	0.51	0.51	0.13	0.71	0.00
Sat Flow, veh/h	1403	0	1252				0	3338	1455	1630	3338	0
Grp Volume(v), veh/h	29	0	165				0	424	788	375	787	0
Grp Sat Flow(s),veh/h/ln	1403	0	1252				0	1626	1455	1630	1626	0
Q Serve(g_s), s	1.5	0.0	11.1				0.0	6.3	44.0	8.7	8.0	0.0
Cycle Q Clear(g_c), s	1.5	0.0	11.1				0.0	6.3	44.0	8.7	8.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	215	0	192				0	1662	743	475	2300	0
V/C Ratio(X)	0.13	0.00	0.86				0.00	0.26	1.06	0.79	0.34	0.00
Avail Cap(c_a), veh/h	261	0	233				0	1662	743	495	2342	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	31.5	0.0	35.6				0.0	11.8	21.1	9.4	4.9	0.0
Incr Delay (d2), s/veh	0.3	0.0	22.9				0.0	0.1	50.0	8.1	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	5.0				0.0	2.8	27.9	5.9	3.6	0.0
LnGrp Delay(d),s/veh	31.8	0.0	58.5				0.0	11.9	71.1	17.6	5.0	0.0
LnGrp LOS	C		E					B	F	B	A	
Approach Vol, veh/h		194						1212			1162	
Approach Delay, s/veh		54.5						50.4			9.0	
Approach LOS		D						D			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	16.9	50.0		19.2		66.9						
Change Period (Y+Rc), s	6.0	6.0		6.0		6.0						
Max Green Setting (Gmax), s	12.0	44.0		16.0		62.0						
Max Q Clear Time (g_c+I1), s	10.7	46.0		13.1		10.0						
Green Ext Time (p_c), s	0.2	0.0		0.3		23.7						
Intersection Summary												
HCM 2010 Ctrl Delay			32.0									
HCM 2010 LOS			C									

HCM 2010 Signalized Intersection Summary

3: Jedburg Road & I-26 WB Ramps










2043 Alt 2 Build Conditions

AM Peak Hour

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	0	194	84	347	0	0	700	109
Future Volume (veh/h)	0	0	0	0	0	194	84	347	0	0	700	109
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				0	0	1727	1712	1712	0	0	1712	1712
Adj Flow Rate, veh/h				0	0	204	88	365	0	0	737	0
Adj No. of Lanes				0	0	1	1	2	0	0	2	1
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				0	0	10	11	11	0	0	11	11
Cap, veh/h				0	0	0	631	2749	0	0	2040	913
Arrive On Green				0.00	0.00	0.00	0.06	0.85	0.00	0.00	0.63	0.00
Sat Flow, veh/h					0		1630	3338	0	0	3338	1455
Grp Volume(v), veh/h					0.0		88	365	0	0	737	0
Grp Sat Flow(s),veh/h/ln							1630	1626	0	0	1626	1455
Q Serve(g_s), s							0.6	0.8	0.0	0.0	4.2	0.0
Cycle Q Clear(g_c), s							0.6	0.8	0.0	0.0	4.2	0.0
Prop In Lane							1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h							631	2749	0	0	2040	913
V/C Ratio(X)							0.14	0.13	0.00	0.00	0.36	0.00
Avail Cap(c_a), veh/h							1116	5200	0	0	3522	1576
HCM Platoon Ratio							1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)							1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh							1.9	0.5	0.0	0.0	3.5	0.0
Incr Delay (d2), s/veh							0.1	0.0	0.0	0.0	0.1	0.0
Initial Q Delay(d3),s/veh							0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln							0.2	0.3	0.0	0.0	1.9	0.0
LnGrp Delay(d),s/veh							2.0	0.5	0.0	0.0	3.6	0.0
LnGrp LOS							A	A			A	
Approach Vol, veh/h								453			737	
Approach Delay, s/veh								0.8			3.6	
Approach LOS								A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6						
Phs Duration (G+Y+Rc), s		38.8			8.4	30.3						
Change Period (Y+Rc), s		6.0			6.0	6.0						
Max Green Setting (Gmax), s		62.0			14.0	42.0						
Max Q Clear Time (g_c+I1), s		2.8			2.6	6.2						
Green Ext Time (p_c), s		9.6			0.1	18.1						
Intersection Summary												
HCM 2010 Ctrl Delay			2.5									
HCM 2010 LOS			A									

HCM 2010 TWSC
4: Jedburg Road & Drop Off Drive

2043 Alt 2 Build Conditions
AM Peak Hour

Intersection												
Int Delay, s/veh	7.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	43	11	120	63	18	18	70	390	81	23	626	70
Future Vol, veh/h	43	11	120	63	18	18	70	390	81	23	626	70
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	175	-	-	200	-	200	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	22	22	22	22	22	22	11	11	11	11	11	11
Mvmt Flow	46	12	128	67	19	19	74	415	86	24	666	74
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1116	1400	370	950	1351	208	740	0	0	501	0	0
Stage 1	751	751	-	563	563	-	-	-	-	-	-	-
Stage 2	365	649	-	387	788	-	-	-	-	-	-	-
Critical Hdwy	7.94	6.94	7.34	7.94	6.94	7.34	4.32	-	-	4.32	-	-
Critical Hdwy Stg 1	6.94	5.94	-	6.94	5.94	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.94	5.94	-	6.94	5.94	-	-	-	-	-	-	-
Follow-up Hdwy	3.72	4.22	3.52	3.72	4.22	3.52	2.31	-	-	2.31	-	-
Pot Cap-1 Maneuver	139	117	573	187	126	740	806	-	-	999	-	-
Stage 1	327	372	-	431	460	-	-	-	-	-	-	-
Stage 2	575	418	-	557	356	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	108	104	573	122	112	740	806	-	-	999	-	-
Mov Cap-2 Maneuver	108	104	-	122	112	-	-	-	-	-	-	-
Stage 1	297	363	-	391	418	-	-	-	-	-	-	-
Stage 2	485	380	-	409	347	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	28.6		52		1.3		0.3					
HCM LOS	D		F									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR		
Capacity (veh/h)	806	-	-	108	416	122	195	999	-	-		
HCM Lane V/C Ratio	0.092	-	-	0.424	0.335	0.549	0.196	0.024	-	-		
HCM Control Delay (s)	9.9	-	-	60.9	18	65.7	27.9	8.7	-	-		
HCM Lane LOS	A	-	-	F	C	F	D	A	-	-		
HCM 95th %tile Q(veh)	0.3	-	-	1.8	1.4	2.6	0.7	0.1	-	-		

Intersection												
Int Delay, s/veh	1.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕		↕	↕↕			↕↕	↕
Traffic Vol, veh/h	0	0	0	0	3	0	139	549	1	0	474	26
Future Vol, veh/h	0	0	0	0	3	0	139	549	1	0	474	26
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	-	-	-	-	0	-	-	-	-	150
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	90	94	90	90	90	94	94	90	90	94	94
Heavy Vehicles, %	25	25	25	25	25	25	21	21	21	21	21	21
Mvmt Flow	0	0	0	0	3	0	148	584	1	0	504	28
Major/Minor				Minor1		Major1		Major2				
Conflicting Flow All				1133	1385	293	504	0	0	-	-	0
Stage 1				881	881	-	-	-	-	-	-	-
Stage 2				252	504	-	-	-	-	-	-	-
Critical Hdwy				7.3	7	7.4	4.52	-	-	-	-	-
Critical Hdwy Stg 1				6.3	6	-	-	-	-	-	-	-
Critical Hdwy Stg 2				6.3	6	-	-	-	-	-	-	-
Follow-up Hdwy				3.75	4.25	3.55	2.41	-	-	-	-	-
Pot Cap-1 Maneuver				164	116	639	935	-	-	0	-	0
Stage 1				314	314	-	-	-	-	0	-	0
Stage 2				702	485	-	-	-	-	0	-	0
Platoon blocked, %								-	-		-	
Mov Cap-1 Maneuver				138	0	639	935	-	-	-	-	-
Mov Cap-2 Maneuver				138	0	-	-	-	-	-	-	-
Stage 1				264	0	-	-	-	-	-	-	-
Stage 2				702	0	-	-	-	-	-	-	-
Approach				WB		NB		SB				
HCM Control Delay, s						1.9		0				
HCM LOS				-								
Minor Lane/Major Mvmt		NBL	NBT	NBRWBLn1		SBT						
Capacity (veh/h)		935	-	-	-	-						
HCM Lane V/C Ratio		0.158	-	-	-	-						
HCM Control Delay (s)		9.6	-	-	-	-						
HCM Lane LOS		A	-	-	-	-						
HCM 95th %tile Q(veh)		0.6	-	-	-	-						

HCM 2010 TWSC
8: I-26 EB Ramp & SC 27




2043 Alt 2 Build Conditions
AM Peak Hour

Intersection												
Int Delay, s/veh	2.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑						↑↑	↑	↑	↑↑	
Traffic Vol, veh/h	0	0	0	0	0	0	0	373	358	329	513	0
Future Vol, veh/h	0	0	0	0	0	0	0	373	358	329	513	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Free	-	-	None
Storage Length	-	-	-	-	-	-	-	-	100	0	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	23	23	23	23	23	23	21	21	21	21	21	21
Mvmt Flow	0	0	0	0	0	0	0	410	393	362	564	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	1698	-	-	0	- 410 0 0
Stage 1	-	1288	-	-	-	- - -
Stage 2	-	410	-	-	-	- - -
Critical Hdwy	-	6.96	-	-	-	4.52 - -
Critical Hdwy Stg 1	-	5.96	-	-	-	- - -
Critical Hdwy Stg 2	-	5.96	-	-	-	- - -
Follow-up Hdwy	-	4.23	-	-	-	2.41 - -
Pot Cap-1 Maneuver	0	74	0	0	- 0	1021 - 0
Stage 1	0	196	0	0	- 0	- - 0
Stage 2	0	544	0	0	- 0	- - 0
Platoon blocked, %					-	-
Mov Cap-1 Maneuver	-	0	-	-	-	1021 - -
Mov Cap-2 Maneuver	-	0	-	-	-	- - -
Stage 1	-	0	-	-	-	- - -
Stage 2	-	0	-	-	-	- - -

Approach	EB	NB	SB
HCM Control Delay, s	0	0	4.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	EBLn1	SBL	SBT
Capacity (veh/h)	-	-	1021	-
HCM Lane V/C Ratio	-	-	0.354	-
HCM Control Delay (s)	-	0	10.4	-
HCM Lane LOS	-	A	B	-
HCM 95th %tile Q(veh)	-	-	1.6	-

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	7	724	1	1	512
Future Vol, veh/h	2	7	724	1	1	512
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	21	21	21	21
Mvmt Flow	2	8	796	1	1	563
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	1081	399	0	0	797	0
Stage 1	797	-	-	-	-	-
Stage 2	284	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.52	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.41	-
Pot Cap-1 Maneuver	212	601	-	-	709	-
Stage 1	404	-	-	-	-	-
Stage 2	739	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	212	601	-	-	709	-
Mov Cap-2 Maneuver	212	-	-	-	-	-
Stage 1	404	-	-	-	-	-
Stage 2	738	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	13.6	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	427	709	-	
HCM Lane V/C Ratio	-	-	0.023	0.002	-	
HCM Control Delay (s)	-	-	13.6	10.1	0	
HCM Lane LOS	-	-	B	B	A	
HCM 95th %tile Q(veh)	-	-	0.1	0	-	

Intersection												
Int Delay, s/veh	3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	8	8	31	39	4	19	10	207	46	16	134	1
Future Vol, veh/h	8	8	31	39	4	19	10	207	46	16	134	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	23	23	23	23	23	23	36	36	36	36	36	36
Mvmt Flow	9	9	34	43	4	21	11	230	51	18	149	1
Major/Minor	Minor2		Minor1		Major1				Major2			
Conflicting Flow All	476	489	150	485	464	256	150	0	0	281	0	0
Stage 1	186	186	-	278	278	-	-	-	-	-	-	-
Stage 2	290	303	-	207	186	-	-	-	-	-	-	-
Critical Hdwy	7.33	6.73	6.43	7.33	6.73	6.43	4.46	-	-	4.46	-	-
Critical Hdwy Stg 1	6.33	5.73	-	6.33	5.73	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.33	5.73	-	6.33	5.73	-	-	-	-	-	-	-
Follow-up Hdwy	3.707	4.207	3.507	3.707	4.207	3.507	2.524	-	-	2.524	-	-
Pot Cap-1 Maneuver	466	450	844	460	466	734	1248	-	-	1109	-	-
Stage 1	769	708	-	685	644	-	-	-	-	-	-	-
Stage 2	675	627	-	749	708	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	439	437	844	425	452	734	1248	-	-	1109	-	-
Mov Cap-2 Maneuver	439	437	-	425	452	-	-	-	-	-	-	-
Stage 1	761	695	-	677	637	-	-	-	-	-	-	-
Stage 2	644	620	-	696	695	-	-	-	-	-	-	-
Approach	EB		WB		NB				SB			
HCM Control Delay, s	11.1		13.5		0.3				0.9			
HCM LOS	B		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1248	-	-	642	490	1109	-	-				
HCM Lane V/C Ratio	0.009	-	-	0.081	0.141	0.016	-	-				
HCM Control Delay (s)	7.9	0	-	11.1	13.5	8.3	0	-				
HCM Lane LOS	A	A	-	B	B	A	A	-				
HCM 95th %tile Q(veh)	0	-	-	0.3	0.5	0	-	-				

Intersection												
Int Delay, s/veh	4.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔			↔			↔	
Traffic Vol, veh/h	0	0	0	71	3	118	33	145	0	0	174	30
Future Vol, veh/h	0	0	0	71	3	118	33	145	0	0	174	30
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	46	46	46	46	46	46	36	36	36	36	36	36
Mvmt Flow	0	0	0	76	3	126	35	154	0	0	185	32
Major/Minor												
Minor1				Major1				Major2				
Conflicting Flow All	425	441	154	217	0	-	-	-	-	-	0	
Stage 1	224	224	-	-	-	-	-	-	-	-	-	
Stage 2	201	217	-	-	-	-	-	-	-	-	-	
Critical Hdwy	6.86	6.96	6.66	4.46	-	-	-	-	-	-	-	
Critical Hdwy Stg 1	5.86	5.96	-	-	-	-	-	-	-	-	-	
Critical Hdwy Stg 2	5.86	5.96	-	-	-	-	-	-	-	-	-	
Follow-up Hdwy	3.914	4.414	3.714	2.524	-	-	-	-	-	-	-	
Pot Cap-1 Maneuver	511	450	788	1175	-	0	0	-	-	-	-	
Stage 1	720	644	-	-	-	0	0	-	-	-	-	
Stage 2	738	649	-	-	-	0	0	-	-	-	-	
Platoon blocked, %					-							
Mov Cap-1 Maneuver	494	0	788	1175	-	-	-	-	-	-	-	
Mov Cap-2 Maneuver	494	0	-	-	-	-	-	-	-	-	-	
Stage 1	696	0	-	-	-	-	-	-	-	-	-	
Stage 2	738	0	-	-	-	-	-	-	-	-	-	
Approach												
WB				NB				SB				
HCM Control Delay, s	13.2			1.5				0				
HCM LOS	B											
Minor Lane/Major Mvmt												
NBL				NBTWBLn1				SBT SBR				
Capacity (veh/h)	1175	-	644	-	-							
HCM Lane V/C Ratio	0.03	-	0.317	-	-							
HCM Control Delay (s)	8.2	0	13.2	-	-							
HCM Lane LOS	A	A	B	-	-							
HCM 95th %tile Q(veh)	0.1	-	1.4	-	-							

Intersection												
Int Delay, s/veh	3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Traffic Vol, veh/h	34	3	30	0	0	0	0	144	83	85	160	0
Future Vol, veh/h	34	3	30	0	0	0	0	144	83	85	160	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	53	53	53	53	53	53	36	36	36	36	36	36
Mvmt Flow	38	3	33	0	0	0	0	160	92	94	178	0




Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	572	618	178	-	0	0	252	0	0
Stage 1	366	366	-	-	-	-	-	-	-
Stage 2	206	252	-	-	-	-	-	-	-
Critical Hdwy	6.93	7.03	6.73	-	-	-	4.46	-	-
Critical Hdwy Stg 1	5.93	6.03	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.93	6.03	-	-	-	-	-	-	-
Follow-up Hdwy	3.977	4.477	3.777	-	-	-	2.524	-	-
Pot Cap-1 Maneuver	406	345	749	0	-	-	1139	-	0
Stage 1	602	542	-	0	-	-	-	-	0
Stage 2	721	614	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	369	0	749	-	-	-	1139	-	-
Mov Cap-2 Maneuver	369	0	-	-	-	-	-	-	-
Stage 1	602	0	-	-	-	-	-	-	-
Stage 2	655	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.8	0	2.9
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	SBL	SBT
Capacity (veh/h)	-	-	484	1139	-
HCM Lane V/C Ratio	-	-	0.154	0.083	-
HCM Control Delay (s)	-	-	13.8	8.4	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.5	0.3	-

Intersection

Int Delay, s/veh 6.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	81	100	66	146	134	56
Future Vol, veh/h	81	100	66	146	134	56
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	19	19	36	36	36	36
Mvmt Flow	89	110	73	160	147	62
























Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	233	0	0 441 153
Stage 1	-	-	- - 153 -
Stage 2	-	-	- - 288 -
Critical Hdwy	4.29	-	- - 6.76 6.56
Critical Hdwy Stg 1	-	-	- - 5.76 -
Critical Hdwy Stg 2	-	-	- - 5.76 -
Follow-up Hdwy	2.371	-	- - 3.824 3.624
Pot Cap-1 Maneuver	1241	-	- - 515 811
Stage 1	-	-	- - 799 -
Stage 2	-	-	- - 689 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1241	-	- - 476 811
Mov Cap-2 Maneuver	-	-	- - 476 -
Stage 1	-	-	- - 738 -
Stage 2	-	-	- - 689 -

Approach	EB	WB	SB
HCM Control Delay, s	3.6	0	15.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1241	-	-	-	542
HCM Lane V/C Ratio	0.072	-	-	-	0.385
HCM Control Delay (s)	8.1	0	-	-	15.7
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	1.8










HCM 2010 Signalized Intersection Summary
15: Volvo Car Drive & Welcome Center/Factory Entrance

2043 Alt 2 Build Conditions
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	0	13	161	0	54	97	801	30	11	451	32
Future Volume (veh/h)	4	0	13	161	0	54	97	801	30	11	451	32
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727
Adj Flow Rate, veh/h	4	0	14	175	0	59	105	871	33	12	490	35
Adj No. of Lanes	1	1	1	1	1	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	10	10	10	10	10	10	10	10	10	10	10	10
Cap, veh/h	205	88	75	403	293	249	275	633	538	154	543	461
Arrive On Green	0.00	0.00	0.05	0.12	0.00	0.17	0.06	0.37	0.37	0.01	0.31	0.31
Sat Flow, veh/h	1645	1727	1468	1645	1727	1468	1645	1727	1468	1645	1727	1468
Grp Volume(v), veh/h	4	0	14	175	0	59	105	871	33	12	490	35
Grp Sat Flow(s),veh/h/ln	1645	1727	1468	1645	1727	1468	1645	1727	1468	1645	1727	1468
Q Serve(g_s), s	0.1	0.0	0.5	5.0	0.0	1.9	2.3	19.6	0.8	0.3	14.6	0.9
Cycle Q Clear(g_c), s	0.1	0.0	0.5	5.0	0.0	1.9	2.3	19.6	0.8	0.3	14.6	0.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	205	88	75	403	293	249	275	633	538	154	543	461
V/C Ratio(X)	0.02	0.00	0.19	0.43	0.00	0.24	0.38	1.38	0.06	0.08	0.90	0.08
Avail Cap(c_a), veh/h	473	515	438	476	515	438	445	633	538	410	548	465
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.0	0.0	24.4	18.7	0.0	19.3	13.3	17.0	11.0	14.9	17.6	12.9
Incr Delay (d2), s/veh	0.0	0.0	1.2	0.7	0.0	0.5	0.9	179.4	0.0	0.2	18.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.2	2.4	0.0	0.8	1.1	40.7	0.3	0.1	9.6	0.4
LnGrp Delay(d),s/veh	24.0	0.0	25.6	19.4	0.0	19.7	14.2	196.4	11.1	15.1	35.8	13.0
LnGrp LOS	C		C	B		B	B	F	B	B	D	B
Approach Vol, veh/h	18		234				1009				537	
Approach Delay, s/veh	25.2		19.5				171.4				33.9	
Approach LOS	C		B				F				C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.5	22.8	6.2	15.1	6.7	25.6	12.6	8.7				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	9.0	17.0	9.0	16.0	9.0	17.0	9.0	16.0				
Max Q Clear Time (g_c+I1), s	4.3	16.6	2.1	3.9	2.3	21.6	7.0	2.5				
Green Ext Time (p_c), s	0.1	0.3	0.0	0.1	0.0	0.0	0.1	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay	109.1											
HCM 2010 LOS	F											

HCM 2010 TWSC
1: Jedburg Road & Old Dairy Road

2043 Alt 2 Build Conditions
PM Peak Hour

Intersection												
Int Delay, s/veh	432.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	88	10	72	14	14	205	37	810	30	132	983	147
Future Vol, veh/h	88	10	72	14	14	205	37	810	30	132	983	147
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Yield	-	-	None	-	-	None
Storage Length	0	-	250	150	-	150	150	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	9	9	9	9	9	9	7	7	7	7	7	7
Mvmt Flow	97	11	79	15	15	225	41	890	33	145	1080	162

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1986	2456	621	1825	2521	462	1242	0	0	923	0	0
Stage 1	1451	1451	-	989	989	-	-	-	-	-	-	-
Stage 2	535	1005	-	836	1532	-	-	-	-	-	-	-
Critical Hdwy	7.68	6.68	7.08	7.68	6.68	7.08	4.24	-	-	4.24	-	-
Critical Hdwy Stg 1	6.68	5.68	-	6.68	5.68	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.68	5.68	-	6.68	5.68	-	-	-	-	-	-	-
Follow-up Hdwy	3.59	4.09	3.39	3.59	4.09	3.39	2.27	-	-	2.27	-	-
Pot Cap-1 Maneuver	~ 33	27	414	44	25	528	530	-	-	705	-	-
Stage 1	128	182	-	252	308	-	-	-	-	-	-	-
Stage 2	479	302	-	313	166	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	~ 4	20	414	16	18	528	530	-	-	705	-	-
Mov Cap-2 Maneuver	~ 4	20	-	16	18	-	-	-	-	-	-	-
Stage 1	118	145	-	233	284	-	-	-	-	-	-	-
Stage 2	240	279	-	186	132	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, \$ 6359.6		74	0.5	1.2
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	530	-	-	4	122	16	18	528	705	-	-
HCM Lane V/C Ratio	0.077	-	-	24.176	0.739	0.962	0.855	0.427	0.206	-	-
HCM Control Delay (s)	12.4	-	-	\$ 12200.9	90.9\$	533.5\$	451.6	16.8	11.4	-	-
HCM Lane LOS	B	-	-	F	F	F	F	C	B	-	-
HCM 95th %tile Q(veh)	0.2	-	-	14.2	4.2	2.4	2.2	2.1	0.8	-	-

Notes											
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon					

HCM 2010 Signalized Intersection Summary

2: Jedburg Road & I-26 EB Ramps


















2043 Alt 2 Build Conditions
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↩	↪					↕	↪	↩	↕	
Traffic Volume (veh/h)	74	3	125	0	0	0	0	476	627	194	1137	0
Future Volume (veh/h)	74	3	125	0	0	0	0	476	627	194	1137	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1597	1597				0	1776	1776	1776	1776	0
Adj Flow Rate, veh/h	78	3	132				0	501	660	204	1197	0
Adj No. of Lanes	0	1	1				0	2	1	1	2	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	19	19	19				0	7	7	7	7	0
Cap, veh/h	195	8	181				0	1798	804	445	2354	0
Arrive On Green	0.13	0.13	0.13				0.00	0.53	0.53	0.08	0.70	0.00
Sat Flow, veh/h	1467	56	1357				0	3463	1509	1691	3463	0
Grp Volume(v), veh/h	81	0	132				0	501	660	204	1197	0
Grp Sat Flow(s),veh/h/ln	1523	0	1357				0	1687	1509	1691	1687	0
Q Serve(g_s), s	3.5	0.0	6.6				0.0	5.8	25.7	3.5	11.8	0.0
Cycle Q Clear(g_c), s	3.5	0.0	6.6				0.0	5.8	25.7	3.5	11.8	0.0
Prop In Lane	0.96		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	203	0	181				0	1798	804	445	2354	0
V/C Ratio(X)	0.40	0.00	0.73				0.00	0.28	0.82	0.46	0.51	0.00
Avail Cap(c_a), veh/h	344	0	306				0	2093	936	595	2949	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	28.2	0.0	29.5				0.0	9.1	13.7	6.0	5.0	0.0
Incr Delay (d2), s/veh	1.3	0.0	5.6				0.0	0.1	5.2	0.7	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	2.8				0.0	2.7	11.8	1.7	5.4	0.0
LnGrp Delay(d),s/veh	29.4	0.0	35.1				0.0	9.2	18.9	6.7	5.2	0.0
LnGrp LOS	C		D					A	B	A	A	
Approach Vol, veh/h		213						1161			1401	
Approach Delay, s/veh		33.0						14.7			5.4	
Approach LOS		C						B			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	11.7	43.8		15.4		55.5						
Change Period (Y+Rc), s	6.0	6.0		6.0		6.0						
Max Green Setting (Gmax), s	12.0	44.0		16.0		62.0						
Max Q Clear Time (g_c+I1), s	5.5	27.7		8.6		13.8						
Green Ext Time (p_c), s	0.3	9.6		1.0		35.7						
Intersection Summary												
HCM 2010 Ctrl Delay			11.4									
HCM 2010 LOS			B									

HCM 2010 Signalized Intersection Summary










3: Jedburg Road & I-26 WB Ramps

2043 Alt 2 Build Conditions
PM Peak Hour

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (veh/h)	0	0	0	0	0	355	107	443	0	0	529	91	
Future Volume (veh/h)	0	0	0	0	0	355	107	443	0	0	529	91	
Number				3	8	18	5	2	12	1	6	16	
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00	
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Adj Sat Flow, veh/h/ln				0	0	1792	1776	1776	0	0	1776	1776	
Adj Flow Rate, veh/h				0	0	374	113	466	0	0	557	0	
Adj No. of Lanes				0	0	1	1	2	0	0	2	1	
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Percent Heavy Veh, %				0	0	6	7	7	0	0	7	7	
Cap, veh/h				0	0	0	731	2761	0	0	1884	843	
Arrive On Green				0.00	0.00	0.00	0.08	0.82	0.00	0.00	0.56	0.00	
Sat Flow, veh/h					0		1691	3463	0	0	3463	1509	
Grp Volume(v), veh/h					0.0		113	466	0	0	557	0	
Grp Sat Flow(s),veh/h/ln							1691	1687	0	0	1687	1509	
Q Serve(g_s), s							0.7	1.0	0.0	0.0	2.9	0.0	
Cycle Q Clear(g_c), s							0.7	1.0	0.0	0.0	2.9	0.0	
Prop In Lane							1.00		0.00	0.00		1.00	
Lane Grp Cap(c), veh/h							731	2761	0	0	1884	843	
V/C Ratio(X)							0.15	0.17	0.00	0.00	0.30	0.00	
Avail Cap(c_a), veh/h							1316	6335	0	0	4291	1920	
HCM Platoon Ratio							1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)							1.00	1.00	0.00	0.00	1.00	0.00	
Uniform Delay (d), s/veh							2.0	0.6	0.0	0.0	3.9	0.0	
Incr Delay (d2), s/veh							0.1	0.0	0.0	0.0	0.1	0.0	
Initial Q Delay(d3),s/veh							0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln							0.3	0.4	0.0	0.0	1.3	0.0	
LnGrp Delay(d),s/veh							2.1	0.7	0.0	0.0	3.9	0.0	
LnGrp LOS							A	A			A		
Approach Vol, veh/h								579			557		
Approach Delay, s/veh								0.9			3.9		
Approach LOS								A			A		
Timer	1	2	3	4	5	6	7	8					
Assigned Phs		2			5	6							
Phs Duration (G+Y+Rc), s		33.0			8.6	24.4							
Change Period (Y+Rc), s		6.0			6.0	6.0							
Max Green Setting (Gmax), s		62.0			14.0	42.0							
Max Q Clear Time (g_c+I1), s		3.0			2.7	4.9							
Green Ext Time (p_c), s		12.8			0.2	13.6							
Intersection Summary													
HCM 2010 Ctrl Delay	2.4												
HCM 2010 LOS	A												

HCM 2010 TWSC
4: Jedburg Road & Drop Off Drive






2043 Alt 2 Build Conditions
PM Peak Hour

Intersection												
Int Delay, s/veh	11.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	36	10	105	88	10	33	91	649	58	18	427	76
Future Vol, veh/h	36	10	105	88	10	33	91	649	58	18	427	76
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	175	-	-	200	-	200	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	8	8	8	8	8	8	7	7	7	7	7	7
Mvmt Flow	39	11	113	95	11	35	98	698	62	19	459	82

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1089	1494	271	1167	1473	349	541	0	0	760	0	0
Stage 1	538	538	-	894	894	-	-	-	-	-	-	-
Stage 2	551	956	-	273	579	-	-	-	-	-	-	-
Critical Hdwy	7.66	6.66	7.06	7.66	6.66	7.06	4.24	-	-	4.24	-	-
Critical Hdwy Stg 1	6.66	5.66	-	6.66	5.66	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.66	5.66	-	6.66	5.66	-	-	-	-	-	-	-
Follow-up Hdwy	3.58	4.08	3.38	3.58	4.08	3.38	2.27	-	-	2.27	-	-
Pot Cap-1 Maneuver	162	115	709	142	119	630	990	-	-	816	-	-
Stage 1	480	506	-	290	344	-	-	-	-	-	-	-
Stage 2	471	321	-	693	484	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	128	101	709	100	105	630	990	-	-	816	-	-
Mov Cap-2 Maneuver	128	101	-	100	105	-	-	-	-	-	-	-
Stage 1	432	494	-	261	310	-	-	-	-	-	-	-
Stage 2	387	289	-	557	473	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	22.5		109.4		1		0.3	
HCM LOS	C		F					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	990	-	-	128	465	100	291	816	-	-
HCM Lane V/C Ratio	0.099	-	-	0.302	0.266	0.946	0.159	0.024	-	-
HCM Control Delay (s)	9	-	-	44.9	15.5	153.3	19.7	9.5	-	-
HCM Lane LOS	A	-	-	E	C	F	C	A	-	-
HCM 95th %tile Q(veh)	0.3	-	-	1.2	1.1	5.6	0.6	0.1	-	-

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	0	9	1	132	595	6	0	690	83
Future Vol, veh/h	0	0	0	0	9	1	132	595	6	0	690	83
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	-	-	-	-	0	-	-	-	-	150
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	90	94	90	90	90	94	94	90	90	94	94
Heavy Vehicles, %	7	7	7	7	7	7	11	11	11	11	11	11
Mvmt Flow	0	0	0	0	10	1	140	633	7	0	734	88
Major/Minor				Minor1		Major1		Major2				
Conflicting Flow All				1284	1651	320	734	0	0	-	-	0
Stage 1				917	917	-	-	-	-	-	-	-
Stage 2				367	734	-	-	-	-	-	-	-
Critical Hdwy				6.94	6.64	7.04	4.32	-	-	-	-	-
Critical Hdwy Stg 1				5.94	5.64	-	-	-	-	-	-	-
Critical Hdwy Stg 2				5.94	5.64	-	-	-	-	-	-	-
Follow-up Hdwy				3.57	4.07	3.37	2.31	-	-	-	-	-
Pot Cap-1 Maneuver				150	93	661	810	-	-	0	-	0
Stage 1				338	338	-	-	-	-	0	-	0
Stage 2				657	412	-	-	-	-	0	-	0
Platoon blocked, %								-	-		-	
Mov Cap-1 Maneuver				124	0	661	810	-	-	-	-	-
Mov Cap-2 Maneuver				124	0	-	-	-	-	-	-	-
Stage 1				280	0	-	-	-	-	-	-	-
Stage 2				657	0	-	-	-	-	-	-	-
Approach				WB		NB		SB				
HCM Control Delay, s				10.5		1.9		0				
HCM LOS				B								
Minor Lane/Major Mvmt		NBL	NBT	NBRWBLn1		SBT						
Capacity (veh/h)		810	-	-	661	-						
HCM Lane V/C Ratio		0.173	-	-	0.017	-						
HCM Control Delay (s)		10.4	-	-	10.5	-						
HCM Lane LOS		B	-	-	B	-						
HCM 95th %tile Q(veh)		0.6	-	-	0.1	-						

HCM 2010 TWSC
8: I-26 EB Ramp & SC 27




2043 Alt 2 Build Conditions
PM Peak Hour

Intersection												
Int Delay, s/veh	3.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑						↑↑	↑	↑	↑↑	
Traffic Vol, veh/h	0	0	0	0	0	0	0	333	240	453	707	0
Future Vol, veh/h	0	0	0	0	0	0	0	333	240	453	707	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Free	-	-	None
Storage Length	-	-	-	-	-	-	-	-	100	0	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	8	8	8	8	8	8	11	11	11	11	11	11
Mvmt Flow	0	0	0	0	0	0	0	366	264	498	777	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	2139	-	-	0	- 366 0 0
Stage 1	-	1773	-	-	-	- - -
Stage 2	-	366	-	-	-	- - -
Critical Hdwy	-	6.66	-	-	-	4.32 - -
Critical Hdwy Stg 1	-	5.66	-	-	-	- - -
Critical Hdwy Stg 2	-	5.66	-	-	-	- - -
Follow-up Hdwy	-	4.08	-	-	-	2.31 - -
Pot Cap-1 Maneuver	0	45	0	0	- 0	1127 - 0
Stage 1	0	126	0	0	- 0	- - 0
Stage 2	0	606	0	0	- 0	- - 0
Platoon blocked, %					-	-
Mov Cap-1 Maneuver	-	0	-	-	-	1127 - -
Mov Cap-2 Maneuver	-	0	-	-	-	- - -
Stage 1	-	0	-	-	-	- - -
Stage 2	-	0	-	-	-	- - -

Approach	EB	NB	SB
HCM Control Delay, s	0	0	4.2
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	EBLn1	SBL	SBT
Capacity (veh/h)	-	-	1127	-
HCM Lane V/C Ratio	-	-	0.442	-
HCM Control Delay (s)	-	0	10.7	-
HCM Lane LOS	-	A	B	-
HCM 95th %tile Q(veh)	-	-	2.3	-

Intersection						
Int Delay, s/veh	0.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	6	6	567	10	12	691
Future Vol, veh/h	6	6	567	10	12	691
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	11	11	11	11
Mvmt Flow	7	7	623	11	13	759
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	1035	317	0	0	634	0
Stage 1	629	-	-	-	-	-
Stage 2	406	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.32	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.31	-
Pot Cap-1 Maneuver	228	679	-	-	886	-
Stage 1	494	-	-	-	-	-
Stage 2	641	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	222	679	-	-	886	-
Mov Cap-2 Maneuver	222	-	-	-	-	-
Stage 1	494	-	-	-	-	-
Stage 2	625	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	16.2	0		0.3		
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	335	886	-	
HCM Lane V/C Ratio	-	-	0.039	0.015	-	
HCM Control Delay (s)	-	-	16.2	9.1	0.1	
HCM Lane LOS	-	-	C	A	A	
HCM 95th %tile Q(veh)	-	-	0.1	0	-	

Intersection												
Int Delay, s/veh	5.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	8	3	28	126	11	21	25	157	36	21	178	15
Future Vol, veh/h	8	3	28	126	11	21	25	157	36	21	178	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	8	8	8	8	8	8	24	24	24	24	24	24
Mvmt Flow	9	3	31	138	12	23	27	173	40	23	196	16

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	515	517	204	514	505	193	212	0	0	213	0	0
Stage 1	250	250	-	247	247	-	-	-	-	-	-	-
Stage 2	265	267	-	267	258	-	-	-	-	-	-	-
Critical Hdwy	7.18	6.58	6.28	7.18	6.58	6.28	4.34	-	-	4.34	-	-
Critical Hdwy Stg 1	6.18	5.58	-	6.18	5.58	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.18	5.58	-	6.18	5.58	-	-	-	-	-	-	-
Follow-up Hdwy	3.572	4.072	3.372	3.572	4.072	3.372	2.416	-	-	2.416	-	-
Pot Cap-1 Maneuver	461	454	822	462	461	833	1238	-	-	1237	-	-
Stage 1	741	689	-	744	691	-	-	-	-	-	-	-
Stage 2	727	677	-	725	683	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	424	434	822	427	440	833	1238	-	-	1237	-	-
Mov Cap-2 Maneuver	424	434	-	427	440	-	-	-	-	-	-	-
Stage 1	722	675	-	725	674	-	-	-	-	-	-	-
Stage 2	677	660	-	680	669	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	10.9		17.6		0.9		0.8	
HCM LOS	B		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1238	-	-	652	458	1237	-
HCM Lane V/C Ratio	0.022	-	-	0.066	0.379	0.019	-
HCM Control Delay (s)	8	0	-	10.9	17.6	8	0
HCM Lane LOS	A	A	-	B	C	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0.2	1.7	0.1	-




Intersection												
Int Delay, s/veh	4.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					<div>↕</div>			<div>↕</div>			<div>↕</div>	
Traffic Vol, veh/h	0	0	0	95	0	103	34	115	0	0	297	35
Future Vol, veh/h	0	0	0	95	0	103	34	115	0	0	297	35
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	21	21	21	21	21	21	24	24	24	24	24	24
Mvmt Flow	0	0	0	106	0	114	38	128	0	0	330	39
Major/Minor				Minor1		Major1		Major2				
Conflicting Flow All				554	573	128	369	0	-	-	-	0
Stage 1				204	204	-	-	-	-	-	-	-
Stage 2				350	369	-	-	-	-	-	-	-
Critical Hdwy				6.61	6.71	6.41	4.34	-	-	-	-	-
Critical Hdwy Stg 1				5.61	5.71	-	-	-	-	-	-	-
Critical Hdwy Stg 2				5.61	5.71	-	-	-	-	-	-	-
Follow-up Hdwy				3.689	4.189	3.489	2.416	-	-	-	-	-
Pot Cap-1 Maneuver				462	405	874	1078	-	0	0	-	-
Stage 1				787	699	-	-	-	0	0	-	-
Stage 2				673	589	-	-	-	0	0	-	-
Platoon blocked, %								-			-	-
Mov Cap-1 Maneuver				444	0	874	1078	-	-	-	-	-
Mov Cap-2 Maneuver				444	0	-	-	-	-	-	-	-
Stage 1				757	0	-	-	-	-	-	-	-
Stage 2				673	0	-	-	-	-	-	-	-
Approach				WB		NB		SB				
HCM Control Delay, s				14.5		1.9		0				
HCM LOS				B								
Minor Lane/Major Mvmt		NBL	NBTWBLn1	SBT	SBR							
Capacity (veh/h)		1078	-	597	-	-						
HCM Lane V/C Ratio		0.035	-	0.369	-	-						
HCM Control Delay (s)		8.5	0	14.5	-	-						
HCM Lane LOS		A	A	B	-	-						
HCM 95th %tile Q(veh)		0.1	-	1.7	-	-						

Intersection												
Int Delay, s/veh	2.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Traffic Vol, veh/h	13	0	24	0	0	0	0	136	66	128	264	0
Future Vol, veh/h	13	0	24	0	0	0	0	136	66	128	264	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	52	52	52	52	52	52	24	24	24	24	24	24
Mvmt Flow	14	0	27	0	0	0	0	151	73	142	293	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	765	801	293	-	0	0	224	0	0
Stage 1	577	577	-	-	-	-	-	-	-
Stage 2	188	224	-	-	-	-	-	-	-
Critical Hdwy	6.92	7.02	6.72	-	-	-	4.34	-	-
Critical Hdwy Stg 1	5.92	6.02	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.92	6.02	-	-	-	-	-	-	-
Follow-up Hdwy	3.968	4.468	3.768	-	-	-	2.416	-	-
Pot Cap-1 Maneuver	309	267	642	0	-	-	1225	-	0
Stage 1	475	430	-	0	-	-	-	-	0
Stage 2	737	635	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	266	0	642	-	-	-	1225	-	-
Mov Cap-2 Maneuver	266	0	-	-	-	-	-	-	-
Stage 1	475	0	-	-	-	-	-	-	-
Stage 2	635	0	-	-	-	-	-	-	-























Approach	EB	NB	SB
HCM Control Delay, s	14.3	0	2.7
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	SBL	SBT
Capacity (veh/h)	-	-	429	1225	-
HCM Lane V/C Ratio	-	-	0.096	0.116	-
HCM Control Delay (s)	-	-	14.3	8.3	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0.4	-

Intersection						
Int Delay, s/veh	8.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	43	106	146	159	209	79
Future Vol, veh/h	43	106	146	159	209	79
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	6	6	24	24	24	24
Mvmt Flow	48	118	162	177	232	88
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	339	0	-	0	465	251
Stage 1	-	-	-	-	251	-
Stage 2	-	-	-	-	214	-
Critical Hdwy	4.16	-	-	-	6.64	6.44
Critical Hdwy Stg 1	-	-	-	-	5.64	-
Critical Hdwy Stg 2	-	-	-	-	5.64	-
Follow-up Hdwy	2.254	-	-	-	3.716	3.516
Pot Cap-1 Maneuver	1198	-	-	-	517	737
Stage 1	-	-	-	-	742	-
Stage 2	-	-	-	-	772	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1198	-	-	-	495	737
Mov Cap-2 Maneuver	-	-	-	-	495	-
Stage 1	-	-	-	-	710	-
Stage 2	-	-	-	-	772	-
Approach	EB	WB		SB		
HCM Control Delay, s	2.3	0		20.6		
HCM LOS				C		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1198	-	-	-	544	
HCM Lane V/C Ratio	0.04	-	-	-	0.588	
HCM Control Delay (s)	8.1	0	-	-	20.6	
HCM Lane LOS	A	A	-	-	C	
HCM 95th %tile Q(veh)	0.1	-	-	-	3.8	

HCM 2010 Signalized Intersection Summary
15: Volvo Car Drive & Welcome Center/Factory Entrance

2043 Alt 2 Build Conditions
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	56	0	171	15	0	4	32	386	15	4	593	12
Future Volume (veh/h)	56	0	171	15	0	4	32	386	15	4	593	12
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727
Adj Flow Rate, veh/h	61	0	186	16	0	4	35	420	16	4	645	13
Adj No. of Lanes	1	1	1	1	1	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	10	10	10	10	10	10	10	10	10	10	10	10
Cap, veh/h	387	281	239	312	230	196	189	612	520	275	567	482
Arrive On Green	0.05	0.00	0.16	0.02	0.00	0.13	0.03	0.35	0.35	0.00	0.33	0.33
Sat Flow, veh/h	1645	1727	1468	1645	1727	1468	1645	1727	1468	1645	1727	1468
Grp Volume(v), veh/h	61	0	186	16	0	4	35	420	16	4	645	13
Grp Sat Flow(s),veh/h/ln	1645	1727	1468	1645	1727	1468	1645	1727	1468	1645	1727	1468
Q Serve(g_s), s	1.6	0.0	6.3	0.4	0.0	0.1	0.7	10.8	0.4	0.1	17.0	0.3
Cycle Q Clear(g_c), s	1.6	0.0	6.3	0.4	0.0	0.1	0.7	10.8	0.4	0.1	17.0	0.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	387	281	239	312	230	196	189	612	520	275	567	482
V/C Ratio(X)	0.16	0.00	0.78	0.05	0.00	0.02	0.19	0.69	0.03	0.01	1.14	0.03
Avail Cap(c_a), veh/h	598	533	453	572	533	453	425	612	520	554	567	482
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.2	0.0	20.8	18.9	0.0	19.5	13.7	14.3	10.9	12.4	17.4	11.8
Incr Delay (d2), s/veh	0.2	0.0	5.5	0.1	0.0	0.0	0.5	3.2	0.0	0.0	82.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	2.9	0.2	0.0	0.1	0.3	5.6	0.2	0.0	20.8	0.1
LnGrp Delay(d),s/veh	18.4	0.0	26.3	19.0	0.0	19.6	14.1	17.5	10.9	12.5	99.5	11.8
LnGrp LOS	B		C	B		B	B	B	B	B	F	B
Approach Vol, veh/h	247					20		471		662		
Approach Delay, s/veh	24.3					19.1		17.0		97.3		
Approach LOS	C					B		B		F		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.6	23.0	8.3	12.9	6.2	24.4	6.8	14.4				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	9.0	17.0	9.0	16.0	9.0	17.0	9.0	16.0				
Max Q Clear Time (g_c+I1), s	2.7	19.0	3.6	2.1	2.1	12.8	2.4	8.3				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	2.2	0.0	0.4				
Intersection Summary												
HCM 2010 Ctrl Delay			56.3									
HCM 2010 LOS			E									










June 2019

D.8 2023 BUILD – ALTERNATIVE 3



HCM 2010 TWSC
1: Jedburg Road & Old Dairy Road

2023 Alt 3 Build Conditions
AM Peak Hour

Intersection												
Int Delay, s/veh	22.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	85	3	37	9	6	88	30	728	19	125	489	94
Future Vol, veh/h	85	3	37	9	6	88	30	728	19	125	489	94
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Yield	-	-	None	-	-	None
Storage Length	0	-	250	150	-	150	150	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	34	34	34	34	34	34	11	11	11	11	11	11
Mvmt Flow	89	3	39	9	6	93	32	766	20	132	515	99

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1279	1679	307	1363	1718	393	614	0	0	786	0	0
Stage 1	829	829	-	840	840	-	-	-	-	-	-	-
Stage 2	450	850	-	523	878	-	-	-	-	-	-	-
Critical Hdwy	8.18	7.18	7.58	8.18	7.18	7.58	4.32	-	-	4.32	-	-
Critical Hdwy Stg 1	7.18	6.18	-	7.18	6.18	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7.18	6.18	-	7.18	6.18	-	-	-	-	-	-	-
Follow-up Hdwy	3.84	4.34	3.64	3.84	4.34	3.64	2.31	-	-	2.31	-	-
Pot Cap-1 Maneuver	94	68	603	80	64	524	903	-	-	773	-	-
Stage 1	270	316	-	266	312	-	-	-	-	-	-	-
Stage 2	481	308	-	431	298	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 60	54	603	61	51	524	903	-	-	773	-	-
Mov Cap-2 Maneuver	~ 60	54	-	61	51	-	-	-	-	-	-	-
Stage 1	261	262	-	257	301	-	-	-	-	-	-	-
Stage 2	374	297	-	330	247	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	280.6		22.9		0.4		1.9	
HCM LOS	F		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	903	-	-	60	342	61	51	524	773	-	-
HCM Lane V/C Ratio	0.035	-	-	1.491	0.123	0.155	0.124	0.177	0.17	-	-
HCM Control Delay (s)	9.1	-	-	\$ 404.6	17	74.6	85.3	13.3	10.6	-	-
HCM Lane LOS	A	-	-	F	C	F	F	B	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	7.9	0.4	0.5	0.4	0.6	0.6	-	-








Notes											
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon					

HCM 2010 Signalized Intersection Summary

2: Jedburg Road & I-26 EB Ramps

2023 Alt 3 Build Conditions

AM Peak Hour


















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	0	123	0	0	0	0	315	586	278	585	0
Future Volume (veh/h)	22	0	123	0	0	0	0	315	586	278	585	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1473	1473				0	1712	1712	1712	1712	0
Adj Flow Rate, veh/h	23	0	129				0	332	617	293	616	0
Adj No. of Lanes	0	1	1				0	2	1	1	2	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	29	29	29				0	11	11	11	11	0
Cap, veh/h	179	0	160				0	1628	728	527	2275	0
Arrive On Green	0.13	0.00	0.13				0.00	0.50	0.50	0.11	0.70	0.00
Sat Flow, veh/h	1403	0	1252				0	3338	1455	1630	3338	0
Grp Volume(v), veh/h	23	0	129				0	332	617	293	616	0
Grp Sat Flow(s),veh/h/ln	1403	0	1252				0	1626	1455	1630	1626	0
Q Serve(g_s), s	1.0	0.0	7.0				0.0	3.9	25.5	5.4	4.9	0.0
Cycle Q Clear(g_c), s	1.0	0.0	7.0				0.0	3.9	25.5	5.4	4.9	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	179	0	160				0	1628	728	527	2275	0
V/C Ratio(X)	0.13	0.00	0.81				0.00	0.20	0.85	0.56	0.27	0.00
Avail Cap(c_a), veh/h	323	0	289				0	2062	922	626	2905	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	26.9	0.0	29.5				0.0	9.6	15.0	6.0	3.9	0.0
Incr Delay (d2), s/veh	0.3	0.0	9.3				0.0	0.1	6.0	0.9	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	2.8				0.0	1.8	11.3	2.5	2.2	0.0
LnGrp Delay(d),s/veh	27.2	0.0	38.7				0.0	9.7	21.1	6.9	3.9	0.0
LnGrp LOS	C		D					A	C	A	A	
Approach Vol, veh/h		152						949			909	
Approach Delay, s/veh		37.0						17.1			4.9	
Approach LOS		D						B			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	13.8	40.8		14.8		54.6						
Change Period (Y+Rc), s	6.0	6.0		6.0		6.0						
Max Green Setting (Gmax), s	12.0	44.0		16.0		62.0						
Max Q Clear Time (g_c+I1), s	7.4	27.5		9.0		6.9						
Green Ext Time (p_c), s	0.4	7.2		0.4		17.8						
Intersection Summary												
HCM 2010 Ctrl Delay			13.1									
HCM 2010 LOS			B									

HCM 2010 Signalized Intersection Summary

3: Jedburg Road & I-26 WB Ramps











2023 Alt 3 Build Conditions

AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	0	152	66	271	0	0	547	85
Future Volume (veh/h)	0	0	0	0	0	152	66	271	0	0	547	85
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				0	0	1727	1712	1712	0	0	1712	1712
Adj Flow Rate, veh/h				0	0	160	69	285	0	0	576	0
Adj No. of Lanes				0	0	1	1	2	0	0	2	1
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				0	0	10	11	11	0	0	11	11
Cap, veh/h				0	0	0	685	2660	0	0	1883	842
Arrive On Green				0.00	0.00	0.00	0.06	0.82	0.00	0.00	0.58	0.00
Sat Flow, veh/h					0		1630	3338	0	0	3338	1455
Grp Volume(v), veh/h					0.0		69	285	0	0	576	0
Grp Sat Flow(s),veh/h/ln							1630	1626	0	0	1626	1455
Q Serve(g_s), s							0.4	0.6	0.0	0.0	3.0	0.0
Cycle Q Clear(g_c), s							0.4	0.6	0.0	0.0	3.0	0.0
Prop In Lane							1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h							685	2660	0	0	1883	842
V/C Ratio(X)							0.10	0.11	0.00	0.00	0.31	0.00
Avail Cap(c_a), veh/h							1285	6121	0	0	4146	1855
HCM Platoon Ratio							1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)							1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh							2.0	0.6	0.0	0.0	3.5	0.0
Incr Delay (d2), s/veh							0.1	0.0	0.0	0.0	0.1	0.0
Initial Q Delay(d3),s/veh							0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln							0.2	0.2	0.0	0.0	1.3	0.0
LnGrp Delay(d),s/veh							2.1	0.6	0.0	0.0	3.6	0.0
LnGrp LOS							A	A			A	
Approach Vol, veh/h								354			576	
Approach Delay, s/veh								0.9			3.6	
Approach LOS								A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6						
Phs Duration (G+Y+Rc), s		32.9			7.9	25.1						
Change Period (Y+Rc), s		6.0			6.0	6.0						
Max Green Setting (Gmax), s		62.0			14.0	42.0						
Max Q Clear Time (g_c+I1), s		2.6			2.4	5.0						
Green Ext Time (p_c), s		7.2			0.1	14.1						
Intersection Summary												
HCM 2010 Ctrl Delay				2.6								
HCM 2010 LOS				A								

HCM 2010 TWSC
4: Jedburg Road & Drop Off Drive






2023 Alt 3 Build Conditions
AM Peak Hour

Intersection												
Int Delay, s/veh	4.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	33	9	94	49	14	14	55	305	63	18	489	55
Future Vol, veh/h	33	9	94	49	14	14	55	305	63	18	489	55
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	175	-	-	200	-	200	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	22	22	22	22	22	22	11	11	11	11	11	11
Mvmt Flow	35	10	100	52	15	15	59	324	67	19	520	59

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	876	1097	290	745	1059	162	579	0	0	391	0	0
Stage 1	588	588	-	442	442	-	-	-	-	-	-	-
Stage 2	288	509	-	303	617	-	-	-	-	-	-	-
Critical Hdwy	7.94	6.94	7.34	7.94	6.94	7.34	4.32	-	-	4.32	-	-
Critical Hdwy Stg 1	6.94	5.94	-	6.94	5.94	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.94	5.94	-	6.94	5.94	-	-	-	-	-	-	-
Follow-up Hdwy	3.72	4.22	3.52	3.72	4.22	3.52	2.31	-	-	2.31	-	-
Pot Cap-1 Maneuver	213	183	650	268	193	795	931	-	-	1102	-	-
Stage 1	416	447	-	514	527	-	-	-	-	-	-	-
Stage 2	642	489	-	628	433	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	184	169	650	204	178	795	931	-	-	1102	-	-
Mov Cap-2 Maneuver	184	169	-	204	178	-	-	-	-	-	-	-
Stage 1	390	439	-	482	494	-	-	-	-	-	-	-
Stage 2	572	458	-	511	426	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	17.4		25		1.2		0.3	
HCM LOS	C		D					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	931	-	-	184	521	204	291	1102	-	-
HCM Lane V/C Ratio	0.063	-	-	0.191	0.21	0.256	0.102	0.017	-	-
HCM Control Delay (s)	9.1	-	-	29.1	13.7	28.6	18.8	8.3	-	-
HCM Lane LOS	A	-	-	D	B	D	C	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.7	0.8	1	0.3	0.1	-	-


















Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	2	0	0	95	414	1	0	359	20
Future Vol, veh/h	0	0	0	2	0	0	95	414	1	0	359	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	-	-	-	-	0	-	-	-	-	150
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	25	25	25	25	25	25	16	16	16	16	16	16
Mvmt Flow	0	0	0	2	0	0	101	440	1	0	382	21
Major/Minor				Minor1		Major1		Major2				
Conflicting Flow All				834	1025	221	382	0	0	-	-	0
Stage 1				643	643	-	-	-	-	-	-	-
Stage 2				191	382	-	-	-	-	-	-	-
Critical Hdwy				7.3	7	7.4	4.42	-	-	-	-	-
Critical Hdwy Stg 1				6.3	6	-	-	-	-	-	-	-
Critical Hdwy Stg 2				6.3	6	-	-	-	-	-	-	-
Follow-up Hdwy				3.75	4.25	3.55	2.36	-	-	-	-	-
Pot Cap-1 Maneuver				265	199	717	1079	-	-	0	-	0
Stage 1				428	414	-	-	-	-	0	-	0
Stage 2				758	557	-	-	-	-	0	-	0
Platoon blocked, %								-	-		-	
Mov Cap-1 Maneuver				240	0	717	1079	-	-	-	-	-
Mov Cap-2 Maneuver				240	0	-	-	-	-	-	-	-
Stage 1				388	0	-	-	-	-	-	-	-
Stage 2				758	0	-	-	-	-	-	-	-
Approach				WB		NB		SB				
HCM Control Delay, s				20.1		1.6		0				
HCM LOS				C								
Minor Lane/Major Mvmt		NBL	NBT	NBRWBLn1		SBT						
Capacity (veh/h)		1079	-	-	240	-						
HCM Lane V/C Ratio		0.094	-	-	0.009	-						
HCM Control Delay (s)		8.7	-	-	20.1	-						
HCM Lane LOS		A	-	-	C	-						
HCM 95th %tile Q(veh)		0.3	-	-	0	-						




HCM 2010 Signalized Intersection Summary

8: I-26 EB Ramp & SC 27

2023 Alt 3 Build Conditions

AM Peak Hour




												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	36	0	83	0	0	0	0	272	258	249	282	0
Future Volume (veh/h)	36	0	83	0	0	0	0	272	258	249	282	0
Number	3	8	18				1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1545	1545				0	1638	1900	1638	1638	0
Adj Flow Rate, veh/h	40	0	0				0	299	0	274	310	0
Adj No. of Lanes	0	1	1				0	2	0	1	2	0
Peak Hour Factor	0.91	0.91	0.91				0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	23	23	23				0	16	16	16	16	0
Cap, veh/h	55	0	49				0	758	0	638	1854	0
Arrive On Green	0.04	0.00	0.00				0.00	0.24	0.00	0.17	0.60	0.00
Sat Flow, veh/h	1471	0	1313				0	3276	0	1560	3194	0
Grp Volume(v), veh/h	40	0	0				0	299	0	274	310	0
Grp Sat Flow(s),veh/h/ln	1471	0	1313				0	1556	0	1560	1556	0
Q Serve(g_s), s	0.9	0.0	0.0				0.0	2.6	0.0	3.7	1.5	0.0
Cycle Q Clear(g_c), s	0.9	0.0	0.0				0.0	2.6	0.0	3.7	1.5	0.0
Prop In Lane	1.00		1.00				0.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	55	0	49				0	758	0	638	1854	0
V/C Ratio(X)	0.73	0.00	0.00				0.00	0.39	0.00	0.43	0.17	0.00
Avail Cap(c_a), veh/h	720	0	643				0	1523	0	852	3046	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	0.00				0.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	15.6	0.0	0.0				0.0	10.3	0.0	6.0	3.0	0.0
Incr Delay (d2), s/veh	16.8	0.0	0.0				0.0	0.3	0.0	0.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.0				0.0	1.2	0.0	1.5	0.6	0.0
LnGrp Delay(d),s/veh	32.4	0.0	0.0				0.0	10.7	0.0	6.4	3.0	0.0
LnGrp LOS	C							B		A	A	
Approach Vol, veh/h		40						299			584	
Approach Delay, s/veh		32.4						10.7			4.6	
Approach LOS		C						B			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		25.5			11.5	14.0		7.2				
Change Period (Y+Rc), s		6.0			6.0	6.0		6.0				
Max Green Setting (Gmax), s		32.0			10.0	16.0		16.0				
Max Q Clear Time (g_c+I1), s		3.5			5.7	4.6		2.9				
Green Ext Time (p_c), s		6.0			0.3	3.3		0.3				
Intersection Summary												
HCM 2010 Ctrl Delay			7.8									
HCM 2010 LOS			A									

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	5	525	1	1	362
Future Vol, veh/h	2	5	525	1	1	362
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	16	16	16	16
Mvmt Flow	2	5	577	1	1	398
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	779	289	0	0	578	0
Stage 1	578	-	-	-	-	-
Stage 2	201	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.42	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.36	-
Pot Cap-1 Maneuver	333	708	-	-	901	-
Stage 1	524	-	-	-	-	-
Stage 2	813	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	333	708	-	-	901	-
Mov Cap-2 Maneuver	333	-	-	-	-	-
Stage 1	524	-	-	-	-	-
Stage 2	812	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	11.8	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	-	536	901	-	
HCM Lane V/C Ratio	-	-	0.014	0.001	-	
HCM Control Delay (s)	-	-	11.8	9	0	
HCM Lane LOS	-	-	B	A	A	
HCM 95th %tile Q(veh)	-	-	0	0	-	

Intersection												
Int Delay, s/veh	2.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	6	26	33	3	16	8	174	39	14	112	1
Future Vol, veh/h	6	6	26	33	3	16	8	174	39	14	112	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	23	23	23	23	23	23	36	36	36	36	36	36
Mvmt Flow	7	7	29	37	3	18	9	193	43	16	124	1
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	400	411	125	408	390	215	125	0	0	236	0	0
Stage 1	157	157	-	233	233	-	-	-	-	-	-	-
Stage 2	243	254	-	175	157	-	-	-	-	-	-	-
Critical Hdwy	7.33	6.73	6.43	7.33	6.73	6.43	4.46	-	-	4.46	-	-
Critical Hdwy Stg 1	6.33	5.73	-	6.33	5.73	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.33	5.73	-	6.33	5.73	-	-	-	-	-	-	-
Follow-up Hdwy	3.707	4.207	3.507	3.707	4.207	3.507	2.524	-	-	2.524	-	-
Pot Cap-1 Maneuver	525	500	872	518	514	775	1276	-	-	1155	-	-
Stage 1	798	730	-	725	675	-	-	-	-	-	-	-
Stage 2	716	660	-	780	730	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	501	489	872	487	502	775	1276	-	-	1155	-	-
Mov Cap-2 Maneuver	501	489	-	487	502	-	-	-	-	-	-	-
Stage 1	792	719	-	719	670	-	-	-	-	-	-	-
Stage 2	691	655	-	736	719	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	10.4		12.3		0.3		0.9					
HCM LOS	B		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1276	-	-	703	551	1155	-	-				
HCM Lane V/C Ratio	0.007	-	-	0.06	0.105	0.013	-	-				
HCM Control Delay (s)	7.8	0	-	10.4	12.3	8.2	0	-				
HCM Lane LOS	A	A	-	B	B	A	A	-				
HCM 95th %tile Q(veh)	0	-	-	0.2	0.3	0	-	-				























Intersection												
Int Delay, s/veh	4.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔			↔			↔	
Traffic Vol, veh/h	0	0	0	60	2	99	27	122	0	0	146	25
Future Vol, veh/h	0	0	0	60	2	99	27	122	0	0	146	25
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	46	46	46	46	46	46	36	36	36	36	36	36
Mvmt Flow	0	0	0	64	2	105	29	130	0	0	155	27
Major/Minor				Minor1		Major1		Major2				
Conflicting Flow All				357	370	130	182	0	-	-	-	0
Stage 1				188	188	-	-	-	-	-	-	-
Stage 2				169	182	-	-	-	-	-	-	-
Critical Hdwy				6.86	6.96	6.66	4.46	-	-	-	-	-
Critical Hdwy Stg 1				5.86	5.96	-	-	-	-	-	-	-
Critical Hdwy Stg 2				5.86	5.96	-	-	-	-	-	-	-
Follow-up Hdwy				3.914	4.414	3.714	2.524	-	-	-	-	-
Pot Cap-1 Maneuver				562	496	814	1213	-	0	0	-	-
Stage 1				749	669	-	-	-	0	0	-	-
Stage 2				765	673	-	-	-	0	0	-	-
Platoon blocked, %								-			-	-
Mov Cap-1 Maneuver				547	0	814	1213	-	-	-	-	-
Mov Cap-2 Maneuver				547	0	-	-	-	-	-	-	-
Stage 1				730	0	-	-	-	-	-	-	-
Stage 2				765	0	-	-	-	-	-	-	-
Approach				WB		NB		SB				
HCM Control Delay, s				12		1.5		0				
HCM LOS				B								
Minor Lane/Major Mvmt				NBL	NBTWBLn1	SBT	SBR					
Capacity (veh/h)				1213	-	687	-					
HCM Lane V/C Ratio				0.024	-	0.249	-					
HCM Control Delay (s)				8	0	12	-					
HCM Lane LOS				A	A	B	-					
HCM 95th %tile Q(veh)				0.1	-	1	-					

Intersection												
Int Delay, s/veh	2.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Traffic Vol, veh/h	28	2	25	0	0	0	0	121	69	71	135	0
Future Vol, veh/h	28	2	25	0	0	0	0	121	69	71	135	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	53	53	53	53	53	53	36	36	36	36	36	36
Mvmt Flow	31	2	28	0	0	0	0	134	77	79	150	0
Major/Minor	Minor2						Major1		Major2			
Conflicting Flow All	481	519	150				-	0	0	211	0	0
Stage 1	308	308	-				-	-	-	-	-	-
Stage 2	173	211	-				-	-	-	-	-	-
Critical Hdwy	6.93	7.03	6.73				-	-	-	4.46	-	-
Critical Hdwy Stg 1	5.93	6.03	-				-	-	-	-	-	-
Critical Hdwy Stg 2	5.93	6.03	-				-	-	-	-	-	-
Follow-up Hdwy	3.977	4.477	3.777				-	-	-	2.524	-	-
Pot Cap-1 Maneuver	462	396	778				0	-	-	1181	-	0
Stage 1	643	578	-				0	-	-	-	-	0
Stage 2	748	642	-				0	-	-	-	-	0
Platoon blocked, %								-	-	-		
Mov Cap-1 Maneuver	428	0	778				-	-	-	1181	-	-
Mov Cap-2 Maneuver	428	0	-				-	-	-	-	-	-
Stage 1	643	0	-				-	-	-	-	-	-
Stage 2	693	0	-				-	-	-	-	-	-
Approach	EB						NB		SB			
HCM Control Delay, s	12.5						0		2.8			
HCM LOS	B											
Minor Lane/Major Mvmt		NBT	NBR	EBLn1	SBL	SBT						
Capacity (veh/h)		-	-	543	1181	-						
HCM Lane V/C Ratio		-	-	0.113	0.067	-						
HCM Control Delay (s)		-	-	12.5	8.3	0						
HCM Lane LOS		-	-	B	A	A						
HCM 95th %tile Q(veh)		-	-	0.4	0.2	-						

Intersection						
Int Delay, s/veh	5.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	68	84	56	122	112	47
Future Vol, veh/h	68	84	56	122	112	47
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	19	19	36	36	36	36
Mvmt Flow	75	92	62	134	123	52
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	196	0	-	0	371	129
Stage 1	-	-	-	-	129	-
Stage 2	-	-	-	-	242	-
Critical Hdwy	4.29	-	-	-	6.76	6.56
Critical Hdwy Stg 1	-	-	-	-	5.76	-
Critical Hdwy Stg 2	-	-	-	-	5.76	-
Follow-up Hdwy	2.371	-	-	-	3.824	3.624
Pot Cap-1 Maneuver	1281	-	-	-	568	837
Stage 1	-	-	-	-	820	-
Stage 2	-	-	-	-	725	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1281	-	-	-	533	837
Mov Cap-2 Maneuver	-	-	-	-	533	-
Stage 1	-	-	-	-	769	-
Stage 2	-	-	-	-	725	-
Approach	EB	WB		SB		
HCM Control Delay, s	3.6	0		13.5		
HCM LOS				B		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1281	-	-	-	597	
HCM Lane V/C Ratio	0.058	-	-	-	0.293	
HCM Control Delay (s)	8	0	-	-	13.5	
HCM Lane LOS	A	A	-	-	B	
HCM 95th %tile Q(veh)	0.2	-	-	-	1.2	










HCM 2010 Signalized Intersection Summary
15: Volvo Car Drive & Welcome Center/Factory Entrance

2023 Alt 3 Build Conditions
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	0	11	24	0	11	76	197	219	72	77	26
Future Volume (veh/h)	3	0	11	24	0	11	76	197	219	72	77	26
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727
Adj Flow Rate, veh/h	3	0	12	26	0	12	83	214	238	78	84	28
Adj No. of Lanes	1	1	1	1	1	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	10	10	10	10	10	10	10	10	10	10	10	10
Cap, veh/h	226	45	38	263	83	70	555	458	390	424	454	386
Arrive On Green	0.00	0.00	0.03	0.03	0.00	0.05	0.06	0.27	0.27	0.06	0.26	0.26
Sat Flow, veh/h	1645	1727	1468	1645	1727	1468	1645	1727	1468	1645	1727	1468
Grp Volume(v), veh/h	3	0	12	26	0	12	83	214	238	78	84	28
Grp Sat Flow(s),veh/h/ln	1645	1727	1468	1645	1727	1468	1645	1727	1468	1645	1727	1468
Q Serve(g_s), s	0.1	0.0	0.3	0.6	0.0	0.3	1.4	4.0	5.5	1.3	1.4	0.6
Cycle Q Clear(g_c), s	0.1	0.0	0.3	0.6	0.0	0.3	1.4	4.0	5.5	1.3	1.4	0.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	226	45	38	263	83	70	555	458	390	424	454	386
V/C Ratio(X)	0.01	0.00	0.31	0.10	0.00	0.17	0.15	0.47	0.61	0.18	0.18	0.07
Avail Cap(c_a), veh/h	606	719	611	606	719	611	839	764	649	713	764	649
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.1	0.0	18.4	17.6	0.0	17.6	9.3	11.8	12.4	9.5	11.0	10.6
Incr Delay (d2), s/veh	0.0	0.0	4.6	0.2	0.0	1.1	0.1	0.7	1.6	0.2	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.2	0.3	0.0	0.1	0.6	2.0	2.4	0.6	0.7	0.2
LnGrp Delay(d),s/veh	18.2	0.0	23.0	17.7	0.0	18.7	9.4	12.6	13.9	9.7	11.2	10.7
LnGrp LOS	B		C	B		B	A	B	B	A	B	B
Approach Vol, veh/h	15				38				535		190	
Approach Delay, s/veh	22.0				18.0				12.7		10.5	
Approach LOS	C				B				B		B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.4	16.1	6.1	7.8	8.3	16.2	7.0	7.0				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	9.0	17.0	9.0	16.0	9.0	17.0	9.0	16.0				
Max Q Clear Time (g_c+I1), s	3.4	3.4	2.1	2.3	3.3	7.5	2.6	2.3				
Green Ext Time (p_c), s	0.1	0.9	0.0	0.0	0.1	2.7	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			12.6									
HCM 2010 LOS			B									

HCM 2010 TWSC
1: Jedburg Road & Old Dairy Road

2023 Alt 3 Build Conditions
PM Peak Hour

Intersection												
Int Delay, s/veh	29.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	69	8	56	11	11	160	29	633	24	103	769	115
Future Vol, veh/h	69	8	56	11	11	160	29	633	24	103	769	115
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Yield	-	-	None	-	-	None
Storage Length	0	-	250	150	-	150	150	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	9	9	9	9	9	9	7	7	7	7	7	7
Mvmt Flow	76	9	62	12	12	176	32	696	26	113	845	126

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1552	1920	486	1426	1970	361	971	0	0	722	0	0
Stage 1	1134	1134	-	773	773	-	-	-	-	-	-	-
Stage 2	418	786	-	653	1197	-	-	-	-	-	-	-
Critical Hdwy	7.68	6.68	7.08	7.68	6.68	7.08	4.24	-	-	4.24	-	-
Critical Hdwy Stg 1	6.68	5.68	-	6.68	5.68	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.68	5.68	-	6.68	5.68	-	-	-	-	-	-	-
Follow-up Hdwy	3.59	4.09	3.39	3.59	4.09	3.39	2.27	-	-	2.27	-	-
Pot Cap-1 Maneuver	~ 72	61	509	90	57	616	676	-	-	844	-	-
Stage 1	204	262	-	343	391	-	-	-	-	-	-	-
Stage 2	565	385	-	406	244	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 36	50	509	59	47	616	676	-	-	844	-	-
Mov Cap-2 Maneuver	~ 36	50	-	59	47	-	-	-	-	-	-	-
Stage 1	194	227	-	327	373	-	-	-	-	-	-	-
Stage 2	372	367	-	297	211	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s\$	401.7		22.9		0.4		1	
HCM LOS	F		C					








Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	676	-	-	36	237	59	47	616	844	-	-
HCM Lane V/C Ratio	0.047	-	-	2.106	0.297	0.205	0.257	0.285	0.134	-	-
HCM Control Delay (s)	10.6	-	-	\$ 749.8	26.5	81.1	106.3	13.2	9.9	-	-
HCM Lane LOS	B	-	-	F	D	F	F	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	8.4	1.2	0.7	0.9	1.2	0.5	-	-

Notes											
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon					

HCM 2010 Signalized Intersection Summary

2: Jedburg Road & I-26 EB Ramps

2023 Alt 3 Build Conditions
PM Peak Hour


















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	58	2	98	0	0	0	0	372	490	152	889	0
Future Volume (veh/h)	58	2	98	0	0	0	0	372	490	152	889	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1597	1597				0	1776	1776	1776	1776	0
Adj Flow Rate, veh/h	61	2	103				0	392	516	160	936	0
Adj No. of Lanes	0	1	1				0	2	1	1	2	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	19	19	19				0	7	7	7	7	0
Cap, veh/h	168	6	155				0	1674	749	502	2279	0
Arrive On Green	0.11	0.11	0.11				0.00	0.50	0.50	0.07	0.68	0.00
Sat Flow, veh/h	1475	48	1357				0	3463	1509	1691	3463	0
Grp Volume(v), veh/h	63	0	103				0	392	516	160	936	0
Grp Sat Flow(s),veh/h/ln	1523	0	1357				0	1687	1509	1691	1687	0
Q Serve(g_s), s	2.2	0.0	4.1				0.0	3.8	14.9	2.4	7.1	0.0
Cycle Q Clear(g_c), s	2.2	0.0	4.1				0.0	3.8	14.9	2.4	7.1	0.0
Prop In Lane	0.97		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	174	0	155				0	1674	749	502	2279	0
V/C Ratio(X)	0.36	0.00	0.67				0.00	0.23	0.69	0.32	0.41	0.00
Avail Cap(c_a), veh/h	427	0	381				0	2604	1165	733	3669	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	23.3	0.0	24.2				0.0	8.2	11.0	5.3	4.2	0.0
Incr Delay (d2), s/veh	1.3	0.0	4.8				0.0	0.1	1.1	0.4	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	1.8				0.0	1.8	6.4	1.1	3.3	0.0
LnGrp Delay(d),s/veh	24.6	0.0	29.1				0.0	8.3	12.1	5.7	4.3	0.0
LnGrp LOS	C		C					A	B	A	A	
Approach Vol, veh/h		166						908			1096	
Approach Delay, s/veh		27.4						10.5			4.5	
Approach LOS		C						B			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	10.2	34.3		12.5		44.5						
Change Period (Y+Rc), s	6.0	6.0		6.0		6.0						
Max Green Setting (Gmax), s	12.0	44.0		16.0		62.0						
Max Q Clear Time (g_c+I1), s	4.4	16.9		6.1		9.1						
Green Ext Time (p_c), s	0.2	9.8		0.9		29.4						
Intersection Summary												
HCM 2010 Ctrl Delay			8.7									
HCM 2010 LOS			A									

HCM 2010 Signalized Intersection Summary

3: Jedburg Road & I-26 WB Ramps











2023 Alt 3 Build Conditions






PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	0	277	84	346	0	0	414	71
Future Volume (veh/h)	0	0	0	0	0	277	84	346	0	0	414	71
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				0	0	1792	1776	1776	0	0	1776	1776
Adj Flow Rate, veh/h				0	0	292	88	364	0	0	436	0
Adj No. of Lanes				0	0	1	1	2	0	0	2	1
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				0	0	6	7	7	0	0	7	7
Cap, veh/h				0	0	0	766	2663	0	0	1715	767
Arrive On Green				0.00	0.00	0.00	0.07	0.79	0.00	0.00	0.51	0.00
Sat Flow, veh/h					0		1691	3463	0	0	3463	1509
Grp Volume(v), veh/h					0.0		88	364	0	0	436	0
Grp Sat Flow(s),veh/h/ln							1691	1687	0	0	1687	1509
Q Serve(g_s), s							0.5	0.7	0.0	0.0	2.1	0.0
Cycle Q Clear(g_c), s							0.5	0.7	0.0	0.0	2.1	0.0
Prop In Lane							1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h							766	2663	0	0	1715	767
V/C Ratio(X)							0.11	0.14	0.00	0.00	0.25	0.00
Avail Cap(c_a), veh/h							1478	7344	0	0	4975	2226
HCM Platoon Ratio							1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)							1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh							2.2	0.7	0.0	0.0	4.0	0.0
Incr Delay (d2), s/veh							0.1	0.0	0.0	0.0	0.1	0.0
Initial Q Delay(d3),s/veh							0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln							0.2	0.3	0.0	0.0	1.0	0.0
LnGrp Delay(d),s/veh							2.2	0.7	0.0	0.0	4.0	0.0
LnGrp LOS							A	A			A	
Approach Vol, veh/h								452			436	
Approach Delay, s/veh								1.0			4.0	
Approach LOS								A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6						
Phs Duration (G+Y+Rc), s		28.5			8.0	20.5						
Change Period (Y+Rc), s		6.0			6.0	6.0						
Max Green Setting (Gmax), s		62.0			14.0	42.0						
Max Q Clear Time (g_c+I1), s		2.7			2.5	4.1						
Green Ext Time (p_c), s		9.6			0.1	10.4						
Intersection Summary												
HCM 2010 Ctrl Delay				2.5								
HCM 2010 LOS				A								

HCM 2010 TWSC
4: Jedburg Road & Drop Off Drive

2023 Alt 3 Build Conditions
PM Peak Hour

Intersection												
Int Delay, s/veh	4.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	28	8	82	69	8	26	71	507	45	14	334	59
Future Vol, veh/h	28	8	82	69	8	26	71	507	45	14	334	59
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	175	-	-	200	-	200	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	8	8	8	8	8	8	7	7	7	7	7	7
Mvmt Flow	30	9	88	74	9	28	76	545	48	15	359	63
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	850	1166	211	911	1149	273	422	0	0	593	0	0
Stage 1	421	421	-	697	697	-	-	-	-	-	-	-
Stage 2	429	745	-	214	452	-	-	-	-	-	-	-
Critical Hdwy	7.66	6.66	7.06	7.66	6.66	7.06	4.24	-	-	4.24	-	-
Critical Hdwy Stg 1	6.66	5.66	-	6.66	5.66	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.66	5.66	-	6.66	5.66	-	-	-	-	-	-	-
Follow-up Hdwy	3.58	4.08	3.38	3.58	4.08	3.38	2.27	-	-	2.27	-	-
Pot Cap-1 Maneuver	244	184	776	220	188	707	1099	-	-	945	-	-
Stage 1	565	572	-	384	427	-	-	-	-	-	-	-
Stage 2	559	405	-	751	554	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	211	169	776	176	172	707	1099	-	-	945	-	-
Mov Cap-2 Maneuver	211	169	-	176	172	-	-	-	-	-	-	-
Stage 1	526	563	-	358	398	-	-	-	-	-	-	-
Stage 2	489	377	-	645	545	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	15.3		31.4		1		0.3					
HCM LOS	C		D									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR		
Capacity (veh/h)	1099	-	-	211	588	176	408	945	-	-		
HCM Lane V/C Ratio	0.069	-	-	0.143	0.165	0.422	0.09	0.016	-	-		
HCM Control Delay (s)	8.5	-	-	24.9	12.3	39.6	14.7	8.9	-	-		
HCM Lane LOS	A	-	-	C	B	E	B	A	-	-		
HCM 95th %tile Q(veh)	0.2	-	-	0.5	0.6	1.9	0.3	0	-	-		



















Intersection												
Int Delay, s/veh	0.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	0	7	1	90	451	4	0	522	63
Future Vol, veh/h	0	0	0	0	7	1	90	451	4	0	522	63
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	-	-	-	-	0	-	-	-	-	150
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	7	7	7	7	7	7	7	7	7	7	7	7
Mvmt Flow	0	0	0	0	8	1	100	501	4	0	580	70
Major/Minor				Minor1		Major1		Major2				
Conflicting Flow All				993	1283	253	580	0	0	-	-	0
Stage 1				703	703	-	-	-	-	-	-	-
Stage 2				290	580	-	-	-	-	-	-	-
Critical Hdwy				6.94	6.64	7.04	4.24	-	-	-	-	-
Critical Hdwy Stg 1				5.94	5.64	-	-	-	-	-	-	-
Critical Hdwy Stg 2				5.94	5.64	-	-	-	-	-	-	-
Follow-up Hdwy				3.57	4.07	3.37	2.27	-	-	-	-	-
Pot Cap-1 Maneuver				234	157	732	956	-	-	0	-	0
Stage 1				439	426	-	-	-	-	0	-	0
Stage 2				719	486	-	-	-	-	0	-	0
Platoon blocked, %								-	-		-	
Mov Cap-1 Maneuver				209	0	732	956	-	-	-	-	-
Mov Cap-2 Maneuver				209	0	-	-	-	-	-	-	-
Stage 1				393	0	-	-	-	-	-	-	-
Stage 2				719	0	-	-	-	-	-	-	-
Approach				WB		NB		SB				
HCM Control Delay, s				10		1.5		0				
HCM LOS				B								
Minor Lane/Major Mvmt		NBL	NBT	NBRWBLn1		SBT						
Capacity (veh/h)		956	-	-	732	-						
HCM Lane V/C Ratio		0.105	-	-	0.012	-						
HCM Control Delay (s)		9.2	-	-	10	-						
HCM Lane LOS		A	-	-	B	-						
HCM 95th %tile Q(veh)		0.3	-	-	0	-						




HCM 2010 Signalized Intersection Summary





8: I-26 EB Ramp & SC 27

2023 Alt 3 Build Conditions

PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	0	112	0	0	0	0	234	176	343	398	0
Future Volume (veh/h)	23	0	112	0	0	0	0	234	176	343	398	0
Number	3	8	18				1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1759	1759				0	1776	1900	1776	1776	0
Adj Flow Rate, veh/h	26	0	0				0	260	0	381	442	0
Adj No. of Lanes	0	1	1				0	2	0	1	2	0
Peak Hour Factor	0.90	0.90	0.90				0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	8	8	8				0	7	7	7	7	0
Cap, veh/h	43	0	38				0	725	0	739	2062	0
Arrive On Green	0.03	0.00	0.00				0.00	0.21	0.00	0.21	0.61	0.00
Sat Flow, veh/h	1675	0	1495				0	3551	0	1691	3463	0
Grp Volume(v), veh/h	26	0	0				0	260	0	381	442	0
Grp Sat Flow(s),veh/h/ln	1675	0	1495				0	1687	0	1691	1687	0
Q Serve(g_s), s	0.5	0.0	0.0				0.0	2.2	0.0	4.9	1.9	0.0
Cycle Q Clear(g_c), s	0.5	0.0	0.0				0.0	2.2	0.0	4.9	1.9	0.0
Prop In Lane	1.00		1.00				0.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	43	0	38				0	725	0	739	2062	0
V/C Ratio(X)	0.60	0.00	0.00				0.00	0.36	0.00	0.52	0.21	0.00
Avail Cap(c_a), veh/h	811	0	724				0	1634	0	889	3268	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	0.00				0.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	15.9	0.0	0.0				0.0	11.0	0.0	6.0	2.9	0.0
Incr Delay (d2), s/veh	12.8	0.0	0.0				0.0	0.3	0.0	0.6	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0				0.0	1.0	0.0	2.2	0.9	0.0
LnGrp Delay(d),s/veh	28.8	0.0	0.0				0.0	11.3	0.0	6.5	2.9	0.0
LnGrp LOS	C							B		A	A	
Approach Vol, veh/h		26						260			823	
Approach Delay, s/veh		28.8						11.3			4.6	
Approach LOS		C						B			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		26.2			13.1	13.1		6.8				
Change Period (Y+Rc), s		6.0			6.0	6.0		6.0				
Max Green Setting (Gmax), s		32.0			10.0	16.0		16.0				
Max Q Clear Time (g_c+I1), s		3.9			6.9	4.2		2.5				
Green Ext Time (p_c), s		8.8			0.4	2.9		0.2				
Intersection Summary												
HCM 2010 Ctrl Delay			6.7									
HCM 2010 LOS			A									

Intersection						
Int Delay, s/veh	0.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	4	4	406	8	9	500
Future Vol, veh/h	4	4	406	8	9	500
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	7	7	7	7
Mvmt Flow	4	4	432	9	10	532
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	723	221	0	0	441	0
Stage 1	437	-	-	-	-	-
Stage 2	286	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.24	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.27	-
Pot Cap-1 Maneuver	361	783	-	-	1081	-
Stage 1	619	-	-	-	-	-
Stage 2	737	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	356	783	-	-	1081	-
Mov Cap-2 Maneuver	356	-	-	-	-	-
Stage 1	619	-	-	-	-	-
Stage 2	727	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	12.5	0		0.2		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	489	1081	-	
HCM Lane V/C Ratio	-	-	0.017	0.009	-	
HCM Control Delay (s)	-	-	12.5	8.4	0.1	
HCM Lane LOS	-	-	B	A	A	
HCM 95th %tile Q(veh)	-	-	0.1	0	-	

Intersection												
Int Delay, s/veh	4.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	2	23	106	9	18	21	132	30	18	149	13
Future Vol, veh/h	6	2	23	106	9	18	21	132	30	18	149	13
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	8	8	8	8	8	8	24	24	24	24	24	24
Mvmt Flow	7	2	25	116	10	20	23	145	33	20	164	14
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	434	435	171	433	426	162	178	0	0	178	0	0
Stage 1	211	211	-	208	208	-	-	-	-	-	-	-
Stage 2	223	224	-	225	218	-	-	-	-	-	-	-
Critical Hdwy	7.18	6.58	6.28	7.18	6.58	6.28	4.34	-	-	4.34	-	-
Critical Hdwy Stg 1	6.18	5.58	-	6.18	5.58	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.18	5.58	-	6.18	5.58	-	-	-	-	-	-	-
Follow-up Hdwy	3.572	4.072	3.372	3.572	4.072	3.372	2.416	-	-	2.416	-	-
Pot Cap-1 Maneuver	522	505	857	523	511	867	1276	-	-	1276	-	-
Stage 1	778	717	-	780	719	-	-	-	-	-	-	-
Stage 2	766	707	-	764	712	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	488	486	857	492	492	867	1276	-	-	1276	-	-
Mov Cap-2 Maneuver	488	486	-	492	492	-	-	-	-	-	-	-
Stage 1	762	705	-	764	705	-	-	-	-	-	-	-
Stage 2	723	693	-	727	700	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	10.3		14.5		0.9		0.8					
HCM LOS	B		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1276	-	-	717	523	1276	-	-				
HCM Lane V/C Ratio	0.018	-	-	0.048	0.279	0.016	-	-				
HCM Control Delay (s)	7.9	0	-	10.3	14.5	7.9	0	-				
HCM Lane LOS	A	A	-	B	B	A	A	-				
HCM 95th %tile Q(veh)	0.1	-	-	0.1	1.1	0	-	-				




Intersection												
Int Delay, s/veh	4.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕			↕			↕	
Traffic Vol, veh/h	0	0	0	80	0	86	28	97	0	0	249	29
Future Vol, veh/h	0	0	0	80	0	86	28	97	0	0	249	29
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	21	21	21	21	21	21	24	24	24	24	24	24
Mvmt Flow	0	0	0	89	0	96	31	108	0	0	277	32
Major/Minor				Minor1		Major1		Major2				
Conflicting Flow All				463	479	108	309	0	-	-	-	0
Stage 1				170	170	-	-	-	-	-	-	-
Stage 2				293	309	-	-	-	-	-	-	-
Critical Hdwy				6.61	6.71	6.41	4.34	-	-	-	-	-
Critical Hdwy Stg 1				5.61	5.71	-	-	-	-	-	-	-
Critical Hdwy Stg 2				5.61	5.71	-	-	-	-	-	-	-
Follow-up Hdwy				3.689	4.189	3.489	2.416	-	-	-	-	-
Pot Cap-1 Maneuver				524	459	897	1137	-	0	0	-	-
Stage 1				816	723	-	-	-	0	0	-	-
Stage 2				716	627	-	-	-	0	0	-	-
Platoon blocked, %								-			-	-
Mov Cap-1 Maneuver				509	0	897	1137	-	-	-	-	-
Mov Cap-2 Maneuver				509	0	-	-	-	-	-	-	-
Stage 1				792	0	-	-	-	-	-	-	-
Stage 2				716	0	-	-	-	-	-	-	-
Approach				WB		NB		SB				
HCM Control Delay, s				12.6		1.8		0				
HCM LOS				B								
Minor Lane/Major Mvmt		NBL	NBTWBLn1	SBT	SBR							
Capacity (veh/h)		1137	-	656	-	-						
HCM Lane V/C Ratio		0.027	-	0.281	-	-						
HCM Control Delay (s)		8.3	0	12.6	-	-						
HCM Lane LOS		A	A	B	-	-						
HCM 95th %tile Q(veh)		0.1	-	1.2	-	-						

Intersection												
Int Delay, s/veh	2.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Traffic Vol, veh/h	11	0	20	0	0	0	0	114	56	107	222	0
Future Vol, veh/h	11	0	20	0	0	0	0	114	56	107	222	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	52	52	52	52	52	52	24	24	24	24	24	24
Mvmt Flow	12	0	22	0	0	0	0	127	62	119	247	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	643	674	247	-	0	0	189	0	0
Stage 1	485	485	-	-	-	-	-	-	-
Stage 2	158	189	-	-	-	-	-	-	-
Critical Hdwy	6.92	7.02	6.72	-	-	-	4.34	-	-
Critical Hdwy Stg 1	5.92	6.02	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.92	6.02	-	-	-	-	-	-	-
Follow-up Hdwy	3.968	4.468	3.768	-	-	-	2.416	-	-
Pot Cap-1 Maneuver	368	319	684	0	-	-	1263	-	0
Stage 1	528	477	-	0	-	-	-	-	0
Stage 2	762	659	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	328	0	684	-	-	-	1263	-	-
Mov Cap-2 Maneuver	328	0	-	-	-	-	-	-	-
Stage 1	528	0	-	-	-	-	-	-	-
Stage 2	679	0	-	-	-	-	-	-	-

























Approach	EB	NB	SB
HCM Control Delay, s	12.8	0	2.6
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	SBL	SBT
Capacity (veh/h)	-	-	494	1263	-
HCM Lane V/C Ratio	-	-	0.07	0.094	-
HCM Control Delay (s)	-	-	12.8	8.1	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0.3	-

Intersection						
Int Delay, s/veh	6.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	36	0	123	134	176	67
Future Vol, veh/h	36	0	123	134	176	67
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	6	6	24	24	24	24
Mvmt Flow	40	0	137	149	196	74
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	286	0	-	0	292	212
Stage 1	-	-	-	-	212	-
Stage 2	-	-	-	-	80	-
Critical Hdwy	4.16	-	-	-	6.64	6.44
Critical Hdwy Stg 1	-	-	-	-	5.64	-
Critical Hdwy Stg 2	-	-	-	-	5.64	-
Follow-up Hdwy	2.254	-	-	-	3.716	3.516
Pot Cap-1 Maneuver	1253	-	-	-	655	776
Stage 1	-	-	-	-	774	-
Stage 2	-	-	-	-	890	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1253	-	-	-	634	776
Mov Cap-2 Maneuver	-	-	-	-	634	-
Stage 1	-	-	-	-	749	-
Stage 2	-	-	-	-	890	-
Approach	EB	WB		SB		
HCM Control Delay, s	8	0		14		
HCM LOS				B		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1253	-	-	-	668	
HCM Lane V/C Ratio	0.032	-	-	-	0.404	
HCM Control Delay (s)	8	0	-	-	14	
HCM Lane LOS	A	A	-	-	B	
HCM 95th %tile Q(veh)	0.1	-	-	-	2	

HCM 2010 Signalized Intersection Summary
15: Volvo Car Drive & Welcome Center/Factory Entrance

2023 Alt 3 Build Conditions
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	0	79	219	0	72	18	112	25	8	174	5
Future Volume (veh/h)	27	0	79	219	0	72	18	112	25	8	174	5
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727
Adj Flow Rate, veh/h	29	0	86	238	0	78	20	122	27	9	189	5
Adj No. of Lanes	1	1	1	1	1	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	10	10	10	10	10	10	10	10	10	10	10	10
Cap, veh/h	322	164	140	537	391	332	291	342	291	334	324	276
Arrive On Green	0.03	0.00	0.10	0.16	0.00	0.23	0.02	0.20	0.20	0.01	0.19	0.19
Sat Flow, veh/h	1645	1727	1468	1645	1727	1468	1645	1727	1468	1645	1727	1468
Grp Volume(v), veh/h	29	0	86	238	0	78	20	122	27	9	189	5
Grp Sat Flow(s),veh/h/ln	1645	1727	1468	1645	1727	1468	1645	1727	1468	1645	1727	1468
Q Serve(g_s), s	0.7	0.0	2.5	5.3	0.0	1.9	0.4	2.7	0.7	0.2	4.4	0.1
Cycle Q Clear(g_c), s	0.7	0.0	2.5	5.3	0.0	1.9	0.4	2.7	0.7	0.2	4.4	0.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	322	164	140	537	391	332	291	342	291	334	324	276
V/C Ratio(X)	0.09	0.00	0.62	0.44	0.00	0.23	0.07	0.36	0.09	0.03	0.58	0.02
Avail Cap(c_a), veh/h	610	621	528	609	621	528	591	659	561	651	659	561
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.5	0.0	19.4	13.0	0.0	14.1	14.4	15.4	14.6	14.5	16.5	14.7
Incr Delay (d2), s/veh	0.1	0.0	4.4	0.6	0.0	0.4	0.1	0.6	0.1	0.0	1.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	1.2	2.4	0.0	0.8	0.2	1.3	0.3	0.1	2.2	0.1
LnGrp Delay(d),s/veh	17.6	0.0	23.7	13.6	0.0	14.4	14.5	16.0	14.7	14.5	18.1	14.8
LnGrp LOS	B		C	B		B	B	B	B	B	B	B
Approach Vol, veh/h		115			316			169			203	
Approach Delay, s/veh		22.2			13.8			15.6			17.9	
Approach LOS		C			B			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.9	14.4	7.2	16.1	6.4	14.8	13.0	10.2				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	9.0	17.0	9.0	16.0	9.0	17.0	9.0	16.0				
Max Q Clear Time (g_c+I1), s	2.4	6.4	2.7	3.9	2.2	4.7	7.3	4.5				
Green Ext Time (p_c), s	0.0	1.9	0.0	0.1	0.0	1.3	0.1	0.2				
Intersection Summary												
HCM 2010 Ctrl Delay			16.4									
HCM 2010 LOS			B									










June 2019

D.9 2043 BUILD – ALTERNATIVE 3



HCM 2010 TWSC
1: Jedburg Road & Old Dairy Road

2043 Alt 3 Build Conditions
AM Peak Hour

Intersection												
Int Delay, s/veh	137.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	109	4	47	11	8	113	39	930	25	160	625	120
Future Vol, veh/h	109	4	47	11	8	113	39	930	25	160	625	120
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Yield	-	-	None	-	-	None
Storage Length	0	-	250	150	-	150	150	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	34	34	34	34	34	34	11	11	11	11	11	11
Mvmt Flow	115	4	49	12	8	119	41	979	26	168	658	126

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1633	2144	392	1741	2194	503	784	0	0	1005	0	0
Stage 1	1057	1057	-	1074	1074	-	-	-	-	-	-	-
Stage 2	576	1087	-	667	1120	-	-	-	-	-	-	-
Critical Hdwy	8.18	7.18	7.58	8.18	7.18	7.58	4.32	-	-	4.32	-	-
Critical Hdwy Stg 1	7.18	6.18	-	7.18	6.18	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7.18	6.18	-	7.18	6.18	-	-	-	-	-	-	-
Follow-up Hdwy	3.84	4.34	3.64	3.84	4.34	3.64	2.31	-	-	2.31	-	-
Pot Cap-1 Maneuver	~ 48	32	525	39	30	438	774	-	-	633	-	-
Stage 1	190	239	-	185	234	-	-	-	-	-	-	-
Stage 2	398	230	-	346	221	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 19	22	525	23	21	438	774	-	-	633	-	-
Mov Cap-2 Maneuver	~ 19	22	-	23	21	-	-	-	-	-	-	-
Stage 1	180	176	-	175	222	-	-	-	-	-	-	-
Stage 2	264	218	-	225	162	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, \$ 1828.9			52.3		0.4		2.3	
HCM LOS	F		F					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	774	-	-	19	188	23	21	438	633	-	-
HCM Lane V/C Ratio	0.053	-	-	6.039	0.286	0.503	0.401	0.272	0.266	-	-
HCM Control Delay (s)	9.9	-	-	\$ 2669.9	31.6	268.8	263.2	16.3	12.7	-	-
HCM Lane LOS	A	-	-	F	D	F	F	C	B	-	-
HCM 95th %tile Q(veh)	0.2	-	-	14.9	1.1	1.5	1.2	1.1	1.1	-	-




















Notes											
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon					

HCM 2010 Signalized Intersection Summary

2: Jedburg Road & I-26 EB Ramps

2043 Alt 3 Build Conditions

AM Peak Hour



















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	28	0	157	0	0	0	0	403	749	356	748	0
Future Volume (veh/h)	28	0	157	0	0	0	0	403	749	356	748	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1473	1473				0	1712	1712	1712	1712	0
Adj Flow Rate, veh/h	29	0	165				0	424	788	375	787	0
Adj No. of Lanes	0	1	1				0	2	1	1	2	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	29	29	29				0	11	11	11	11	0
Cap, veh/h	215	0	192				0	1662	743	475	2300	0
Arrive On Green	0.15	0.00	0.15				0.00	0.51	0.51	0.13	0.71	0.00
Sat Flow, veh/h	1403	0	1252				0	3338	1455	1630	3338	0
Grp Volume(v), veh/h	29	0	165				0	424	788	375	787	0
Grp Sat Flow(s),veh/h/ln	1403	0	1252				0	1626	1455	1630	1626	0
Q Serve(g_s), s	1.5	0.0	11.1				0.0	6.3	44.0	8.7	8.0	0.0
Cycle Q Clear(g_c), s	1.5	0.0	11.1				0.0	6.3	44.0	8.7	8.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	215	0	192				0	1662	743	475	2300	0
V/C Ratio(X)	0.13	0.00	0.86				0.00	0.26	1.06	0.79	0.34	0.00
Avail Cap(c_a), veh/h	261	0	233				0	1662	743	495	2342	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	31.5	0.0	35.6				0.0	11.8	21.1	9.4	4.9	0.0
Incr Delay (d2), s/veh	0.3	0.0	22.9				0.0	0.1	50.0	8.1	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	5.0				0.0	2.8	27.9	5.9	3.6	0.0
LnGrp Delay(d),s/veh	31.8	0.0	58.5				0.0	11.9	71.1	17.6	5.0	0.0
LnGrp LOS	C		E					B	F	B	A	
Approach Vol, veh/h		194						1212			1162	
Approach Delay, s/veh		54.5						50.4			9.0	
Approach LOS		D						D			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	16.9	50.0		19.2		66.9						
Change Period (Y+Rc), s	6.0	6.0		6.0		6.0						
Max Green Setting (Gmax), s	12.0	44.0		16.0		62.0						
Max Q Clear Time (g_c+I1), s	10.7	46.0		13.1		10.0						
Green Ext Time (p_c), s	0.2	0.0		0.3		23.7						
Intersection Summary												
HCM 2010 Ctrl Delay			32.0									
HCM 2010 LOS			C									

HCM 2010 Signalized Intersection Summary

3: Jedburg Road & I-26 WB Ramps










2043 Alt 3 Build Conditions

AM Peak Hour

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	0	194	84	347	0	0	700	109
Future Volume (veh/h)	0	0	0	0	0	194	84	347	0	0	700	109
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				0	0	1727	1712	1712	0	0	1712	1712
Adj Flow Rate, veh/h				0	0	204	88	365	0	0	737	0
Adj No. of Lanes				0	0	1	1	2	0	0	2	1
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				0	0	10	11	11	0	0	11	11
Cap, veh/h				0	0	0	631	2749	0	0	2040	913
Arrive On Green				0.00	0.00	0.00	0.06	0.85	0.00	0.00	0.63	0.00
Sat Flow, veh/h					0		1630	3338	0	0	3338	1455
Grp Volume(v), veh/h					0.0		88	365	0	0	737	0
Grp Sat Flow(s),veh/h/ln							1630	1626	0	0	1626	1455
Q Serve(g_s), s							0.6	0.8	0.0	0.0	4.2	0.0
Cycle Q Clear(g_c), s							0.6	0.8	0.0	0.0	4.2	0.0
Prop In Lane							1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h							631	2749	0	0	2040	913
V/C Ratio(X)							0.14	0.13	0.00	0.00	0.36	0.00
Avail Cap(c_a), veh/h							1116	5200	0	0	3522	1576
HCM Platoon Ratio							1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)							1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh							1.9	0.5	0.0	0.0	3.5	0.0
Incr Delay (d2), s/veh							0.1	0.0	0.0	0.0	0.1	0.0
Initial Q Delay(d3),s/veh							0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln							0.2	0.3	0.0	0.0	1.9	0.0
LnGrp Delay(d),s/veh							2.0	0.5	0.0	0.0	3.6	0.0
LnGrp LOS							A	A			A	
Approach Vol, veh/h								453			737	
Approach Delay, s/veh								0.8			3.6	
Approach LOS								A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6						
Phs Duration (G+Y+Rc), s		38.8			8.4	30.3						
Change Period (Y+Rc), s		6.0			6.0	6.0						
Max Green Setting (Gmax), s		62.0			14.0	42.0						
Max Q Clear Time (g_c+I1), s		2.8			2.6	6.2						
Green Ext Time (p_c), s		9.6			0.1	18.1						
Intersection Summary												
HCM 2010 Ctrl Delay			2.5									
HCM 2010 LOS			A									

HCM 2010 TWSC
4: Jedburg Road & Drop Off Drive






2043 Alt 3 Build Conditions
AM Peak Hour

Intersection												
Int Delay, s/veh	7.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	43	11	120	63	18	18	70	390	81	23	626	70
Future Vol, veh/h	43	11	120	63	18	18	70	390	81	23	626	70
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	175	-	-	200	-	200	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	22	22	22	22	22	22	11	11	11	11	11	11
Mvmt Flow	46	12	128	67	19	19	74	415	86	24	666	74

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1116	1400	370	950	1351	208	740	0	0	501	0	0
Stage 1	751	751	-	563	563	-	-	-	-	-	-	-
Stage 2	365	649	-	387	788	-	-	-	-	-	-	-
Critical Hdwy	7.94	6.94	7.34	7.94	6.94	7.34	4.32	-	-	4.32	-	-
Critical Hdwy Stg 1	6.94	5.94	-	6.94	5.94	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.94	5.94	-	6.94	5.94	-	-	-	-	-	-	-
Follow-up Hdwy	3.72	4.22	3.52	3.72	4.22	3.52	2.31	-	-	2.31	-	-
Pot Cap-1 Maneuver	139	117	573	187	126	740	806	-	-	999	-	-
Stage 1	327	372	-	431	460	-	-	-	-	-	-	-
Stage 2	575	418	-	557	356	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	108	104	573	122	112	740	806	-	-	999	-	-
Mov Cap-2 Maneuver	108	104	-	122	112	-	-	-	-	-	-	-
Stage 1	297	363	-	391	418	-	-	-	-	-	-	-
Stage 2	485	380	-	409	347	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	28.6		52		1.3		0.3	
HCM LOS	D		F					




Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	806	-	-	108	416	122	195	999	-	-
HCM Lane V/C Ratio	0.092	-	-	0.424	0.335	0.549	0.196	0.024	-	-
HCM Control Delay (s)	9.9	-	-	60.9	18	65.7	27.9	8.7	-	-
HCM Lane LOS	A	-	-	F	C	F	D	A	-	-
HCM 95th %tile Q(veh)	0.3	-	-	1.8	1.4	2.6	0.7	0.1	-	-





Intersection												
Int Delay, s/veh	1.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	0	3	0	139	549	1	0	474	26
Future Vol, veh/h	0	0	0	0	3	0	139	549	1	0	474	26
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	-	-	-	-	0	-	-	-	-	150
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	90	94	90	90	90	94	94	90	90	94	94
Heavy Vehicles, %	25	25	25	25	25	25	22	22	22	22	22	22
Mvmt Flow	0	0	0	0	3	0	148	584	1	0	504	28
Major/Minor				Minor1		Major1		Major2				
Conflicting Flow All				1133	1385	293	504	0	0	-	-	0
Stage 1				881	881	-	-	-	-	-	-	-
Stage 2				252	504	-	-	-	-	-	-	-
Critical Hdwy				7.3	7	7.4	4.54	-	-	-	-	-
Critical Hdwy Stg 1				6.3	6	-	-	-	-	-	-	-
Critical Hdwy Stg 2				6.3	6	-	-	-	-	-	-	-
Follow-up Hdwy				3.75	4.25	3.55	2.42	-	-	-	-	-
Pot Cap-1 Maneuver				164	116	639	929	-	-	0	-	0
Stage 1				314	314	-	-	-	-	0	-	0
Stage 2				702	485	-	-	-	-	0	-	0
Platoon blocked, %								-	-		-	
Mov Cap-1 Maneuver				138	0	639	929	-	-	-	-	-
Mov Cap-2 Maneuver				138	0	-	-	-	-	-	-	-
Stage 1				264	0	-	-	-	-	-	-	-
Stage 2				702	0	-	-	-	-	-	-	-
Approach				WB		NB		SB				
HCM Control Delay, s						1.9		0				
HCM LOS				-								
Minor Lane/Major Mvmt		NBL	NBT	NBRWBLn1		SBT						
Capacity (veh/h)		929	-	-	-	-						
HCM Lane V/C Ratio		0.159	-	-	-	-						
HCM Control Delay (s)		9.6	-	-	-	-						
HCM Lane LOS		A	-	-	-	-						
HCM 95th %tile Q(veh)		0.6	-	-	-	-						

HCM 2010 Signalized Intersection Summary 8: I-26 EB Ramp & SC 27

2043 Alt 3 Build Conditions
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↩	↪					↩↪		↩	↩↪	
Traffic Volume (veh/h)	47	0	122	0	0	0	0	373	358	329	389	0
Future Volume (veh/h)	47	0	122	0	0	0	0	373	358	329	389	0
Number	3	8	18				1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1545	1545				0	1557	1900	1557	1557	0
Adj Flow Rate, veh/h	52	0	0				0	410	0	362	427	0
Adj No. of Lanes	0	1	1				0	2	0	1	2	0
Peak Hour Factor	0.91	0.91	0.91				0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	23	23	23				0	22	22	22	22	0
Cap, veh/h	65	0	58				0	816	0	625	1893	0
Arrive On Green	0.04	0.00	0.00				0.00	0.28	0.00	0.21	0.64	0.00
Sat Flow, veh/h	1471	0	1313				0	3115	0	1483	3037	0
Grp Volume(v), veh/h	52	0	0				0	410	0	362	427	0
Grp Sat Flow(s),veh/h/ln	1471	0	1313				0	1480	0	1483	1480	0
Q Serve(g_s), s	1.3	0.0	0.0				0.0	4.4	0.0	5.7	2.3	0.0
Cycle Q Clear(g_c), s	1.3	0.0	0.0				0.0	4.4	0.0	5.7	2.3	0.0
Prop In Lane	1.00		1.00				0.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	65	0	58				0	816	0	625	1893	0
V/C Ratio(X)	0.79	0.00	0.00				0.00	0.50	0.00	0.58	0.23	0.00
Avail Cap(c_a), veh/h	619	0	553				0	1246	0	709	2491	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	0.00				0.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	18.0	0.0	0.0				0.0	11.6	0.0	6.4	2.9	0.0
Incr Delay (d2), s/veh	19.1	0.0	0.0				0.0	0.5	0.0	0.9	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.0				0.0	1.8	0.0	2.4	0.9	0.0
LnGrp Delay(d),s/veh	37.1	0.0	0.0				0.0	12.1	0.0	7.3	2.9	0.0
LnGrp LOS	D							B		A	A	
Approach Vol, veh/h		52						410			789	
Approach Delay, s/veh		37.1						12.1			5.0	
Approach LOS		D						B			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		30.3			13.8	16.5		7.7				
Change Period (Y+Rc), s		6.0			6.0	6.0		6.0				
Max Green Setting (Gmax), s		32.0			10.0	16.0		16.0				
Max Q Clear Time (g_c+I1), s		4.3			7.7	6.4		3.3				
Green Ext Time (p_c), s		8.5			0.3	4.1		0.5				
Intersection Summary												
HCM 2010 Ctrl Delay			8.6									
HCM 2010 LOS			A									

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	7	724	1	1	509
Future Vol, veh/h	2	7	724	1	1	509
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	22	22	22	22
Mvmt Flow	2	8	796	1	1	559
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	1079	399	0	0	797	0
Stage 1	797	-	-	-	-	-
Stage 2	282	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.54	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.42	-
Pot Cap-1 Maneuver	213	601	-	-	703	-
Stage 1	404	-	-	-	-	-
Stage 2	741	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	213	601	-	-	703	-
Mov Cap-2 Maneuver	213	-	-	-	-	-
Stage 1	404	-	-	-	-	-
Stage 2	740	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	13.6	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	- 428		703	-	
HCM Lane V/C Ratio	-	- 0.023		0.002	-	
HCM Control Delay (s)	-	- 13.6		10.1	0	
HCM Lane LOS	-	- B		B	A	
HCM 95th %tile Q(veh)	-	- 0.1		0	-	

Intersection												
Int Delay, s/veh	3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	8	8	31	39	4	19	10	207	46	16	134	1
Future Vol, veh/h	8	8	31	39	4	19	10	207	46	16	134	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	23	23	23	23	23	23	36	36	36	36	36	36
Mvmt Flow	9	9	34	43	4	21	11	230	51	18	149	1
Major/Minor	Minor2		Minor1		Major1				Major2			
Conflicting Flow All	476	489	150	485	464	256	150	0	0	281	0	0
Stage 1	186	186	-	278	278	-	-	-	-	-	-	-
Stage 2	290	303	-	207	186	-	-	-	-	-	-	-
Critical Hdwy	7.33	6.73	6.43	7.33	6.73	6.43	4.46	-	-	4.46	-	-
Critical Hdwy Stg 1	6.33	5.73	-	6.33	5.73	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.33	5.73	-	6.33	5.73	-	-	-	-	-	-	-
Follow-up Hdwy	3.707	4.207	3.507	3.707	4.207	3.507	2.524	-	-	2.524	-	-
Pot Cap-1 Maneuver	466	450	844	460	466	734	1248	-	-	1109	-	-
Stage 1	769	708	-	685	644	-	-	-	-	-	-	-
Stage 2	675	627	-	749	708	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	439	437	844	425	452	734	1248	-	-	1109	-	-
Mov Cap-2 Maneuver	439	437	-	425	452	-	-	-	-	-	-	-
Stage 1	761	695	-	677	637	-	-	-	-	-	-	-
Stage 2	644	620	-	696	695	-	-	-	-	-	-	-
Approach	EB		WB		NB				SB			
HCM Control Delay, s	11.1		13.5		0.3				0.9			
HCM LOS	B		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1248	-	-	642	490	1109	-	-				
HCM Lane V/C Ratio	0.009	-	-	0.081	0.141	0.016	-	-				
HCM Control Delay (s)	7.9	0	-	11.1	13.5	8.3	0	-				
HCM Lane LOS	A	A	-	B	B	A	A	-				
HCM 95th %tile Q(veh)	0	-	-	0.3	0.5	0	-	-				

Intersection												
Int Delay, s/veh	4.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔			↔			↔	
Traffic Vol, veh/h	0	0	0	71	3	118	33	145	0	0	174	30
Future Vol, veh/h	0	0	0	71	3	118	33	145	0	0	174	30
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	46	46	46	46	46	46	36	36	36	36	36	36
Mvmt Flow	0	0	0	76	3	126	35	154	0	0	185	32
Major/Minor												
Minor1				Major1				Major2				
Conflicting Flow All	425	441	154	217	0	-	-	-	-	-	0	
Stage 1	224	224	-	-	-	-	-	-	-	-	-	
Stage 2	201	217	-	-	-	-	-	-	-	-	-	
Critical Hdwy	6.86	6.96	6.66	4.46	-	-	-	-	-	-	-	
Critical Hdwy Stg 1	5.86	5.96	-	-	-	-	-	-	-	-	-	
Critical Hdwy Stg 2	5.86	5.96	-	-	-	-	-	-	-	-	-	
Follow-up Hdwy	3.914	4.414	3.714	2.524	-	-	-	-	-	-	-	
Pot Cap-1 Maneuver	511	450	788	1175	-	0	0	-	-	-	-	
Stage 1	720	644	-	-	-	0	0	-	-	-	-	
Stage 2	738	649	-	-	-	0	0	-	-	-	-	
Platoon blocked, %					-							
Mov Cap-1 Maneuver	494	0	788	1175	-	-	-	-	-	-	-	
Mov Cap-2 Maneuver	494	0	-	-	-	-	-	-	-	-	-	
Stage 1	696	0	-	-	-	-	-	-	-	-	-	
Stage 2	738	0	-	-	-	-	-	-	-	-	-	
Approach												
WB				NB				SB				
HCM Control Delay, s	13.2			1.5				0				
HCM LOS	B											
Minor Lane/Major Mvmt												
NBL				NBTWBLn1				SBT SBR				
Capacity (veh/h)	1175	-	644	-	-							
HCM Lane V/C Ratio	0.03	-	0.317	-	-							
HCM Control Delay (s)	8.2	0	13.2	-	-							
HCM Lane LOS	A	A	B	-	-							
HCM 95th %tile Q(veh)	0.1	-	1.4	-	-							

Intersection												
Int Delay, s/veh	3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Traffic Vol, veh/h	34	3	30	0	0	0	0	144	83	85	160	0
Future Vol, veh/h	34	3	30	0	0	0	0	144	83	85	160	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	53	53	53	53	53	53	36	36	36	36	36	36
Mvmt Flow	38	3	33	0	0	0	0	160	92	94	178	0




Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	572	618	178	-	0	0	252	0	0
Stage 1	366	366	-	-	-	-	-	-	-
Stage 2	206	252	-	-	-	-	-	-	-
Critical Hdwy	6.93	7.03	6.73	-	-	-	4.46	-	-
Critical Hdwy Stg 1	5.93	6.03	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.93	6.03	-	-	-	-	-	-	-
Follow-up Hdwy	3.977	4.477	3.777	-	-	-	2.524	-	-
Pot Cap-1 Maneuver	406	345	749	0	-	-	1139	-	0
Stage 1	602	542	-	0	-	-	-	-	0
Stage 2	721	614	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	369	0	749	-	-	-	1139	-	-
Mov Cap-2 Maneuver	369	0	-	-	-	-	-	-	-
Stage 1	602	0	-	-	-	-	-	-	-
Stage 2	655	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.8	0	2.9
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	SBL	SBT
Capacity (veh/h)	-	-	484	1139	-
HCM Lane V/C Ratio	-	-	0.154	0.083	-
HCM Control Delay (s)	-	-	13.8	8.4	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.5	0.3	-

Intersection

Int Delay, s/veh 6.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	81	100	66	146	134	56
Future Vol, veh/h	81	100	66	146	134	56
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	19	19	36	36	36	36
Mvmt Flow	89	110	73	160	147	62
























Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	233	0	0 441 153
Stage 1	-	-	- - 153 -
Stage 2	-	-	- - 288 -
Critical Hdwy	4.29	-	- - 6.76 6.56
Critical Hdwy Stg 1	-	-	- - 5.76 -
Critical Hdwy Stg 2	-	-	- - 5.76 -
Follow-up Hdwy	2.371	-	- - 3.824 3.624
Pot Cap-1 Maneuver	1241	-	- - 515 811
Stage 1	-	-	- - 799 -
Stage 2	-	-	- - 689 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1241	-	- - 476 811
Mov Cap-2 Maneuver	-	-	- - 476 -
Stage 1	-	-	- - 738 -
Stage 2	-	-	- - 689 -

Approach	EB	WB	SB
HCM Control Delay, s	3.6	0	15.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1241	-	-	-	542
HCM Lane V/C Ratio	0.072	-	-	-	0.385
HCM Control Delay (s)	8.1	0	-	-	15.7
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	1.8










HCM 2010 Signalized Intersection Summary
15: Volvo Car Drive & Welcome Center/Factory Entrance

2043 Alt 3 Build Conditions
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	0	13	161	0	54	97	801	30	11	451	32
Future Volume (veh/h)	4	0	13	161	0	54	97	801	30	11	451	32
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727
Adj Flow Rate, veh/h	4	0	14	175	0	59	105	871	33	12	490	35
Adj No. of Lanes	1	1	1	1	1	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	10	10	10	10	10	10	10	10	10	10	10	10
Cap, veh/h	205	88	75	403	293	249	275	633	538	154	543	461
Arrive On Green	0.00	0.00	0.05	0.12	0.00	0.17	0.06	0.37	0.37	0.01	0.31	0.31
Sat Flow, veh/h	1645	1727	1468	1645	1727	1468	1645	1727	1468	1645	1727	1468
Grp Volume(v), veh/h	4	0	14	175	0	59	105	871	33	12	490	35
Grp Sat Flow(s),veh/h/ln	1645	1727	1468	1645	1727	1468	1645	1727	1468	1645	1727	1468
Q Serve(g_s), s	0.1	0.0	0.5	5.0	0.0	1.9	2.3	19.6	0.8	0.3	14.6	0.9
Cycle Q Clear(g_c), s	0.1	0.0	0.5	5.0	0.0	1.9	2.3	19.6	0.8	0.3	14.6	0.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	205	88	75	403	293	249	275	633	538	154	543	461
V/C Ratio(X)	0.02	0.00	0.19	0.43	0.00	0.24	0.38	1.38	0.06	0.08	0.90	0.08
Avail Cap(c_a), veh/h	473	515	438	476	515	438	445	633	538	410	548	465
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.0	0.0	24.4	18.7	0.0	19.3	13.3	17.0	11.0	14.9	17.6	12.9
Incr Delay (d2), s/veh	0.0	0.0	1.2	0.7	0.0	0.5	0.9	179.4	0.0	0.2	18.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.2	2.4	0.0	0.8	1.1	40.7	0.3	0.1	9.6	0.4
LnGrp Delay(d),s/veh	24.0	0.0	25.6	19.4	0.0	19.7	14.2	196.4	11.1	15.1	35.8	13.0
LnGrp LOS	C		C	B		B	B	F	B	B	D	B
Approach Vol, veh/h	18					234		1009		537		
Approach Delay, s/veh	25.2					19.5		171.4		33.9		
Approach LOS	C					B		F		C		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.5	22.8	6.2	15.1	6.7	25.6	12.6	8.7				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	9.0	17.0	9.0	16.0	9.0	17.0	9.0	16.0				
Max Q Clear Time (g_c+I1), s	4.3	16.6	2.1	3.9	2.3	21.6	7.0	2.5				
Green Ext Time (p_c), s	0.1	0.3	0.0	0.1	0.0	0.0	0.1	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay	109.1											
HCM 2010 LOS	F											

HCM 2010 TWSC
1: Jedburg Road & Old Dairy Road

2043 Alt 3 Build Conditions
PM Peak Hour

Intersection												
Int Delay, s/veh	432.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	88	10	72	14	14	205	37	810	30	132	983	147
Future Vol, veh/h	88	10	72	14	14	205	37	810	30	132	983	147
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Yield	-	-	None	-	-	None
Storage Length	0	-	250	150	-	150	150	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	9	9	9	9	9	9	7	7	7	7	7	7
Mvmt Flow	97	11	79	15	15	225	41	890	33	145	1080	162

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1986	2456	621	1825	2521	462	1242	0	0	923	0	0
Stage 1	1451	1451	-	989	989	-	-	-	-	-	-	-
Stage 2	535	1005	-	836	1532	-	-	-	-	-	-	-
Critical Hdwy	7.68	6.68	7.08	7.68	6.68	7.08	4.24	-	-	4.24	-	-
Critical Hdwy Stg 1	6.68	5.68	-	6.68	5.68	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.68	5.68	-	6.68	5.68	-	-	-	-	-	-	-
Follow-up Hdwy	3.59	4.09	3.39	3.59	4.09	3.39	2.27	-	-	2.27	-	-
Pot Cap-1 Maneuver	~ 33	27	414	44	25	528	530	-	-	705	-	-
Stage 1	128	182	-	252	308	-	-	-	-	-	-	-
Stage 2	479	302	-	313	166	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 4	20	414	16	18	528	530	-	-	705	-	-
Mov Cap-2 Maneuver	~ 4	20	-	16	18	-	-	-	-	-	-	-
Stage 1	118	145	-	233	284	-	-	-	-	-	-	-
Stage 2	240	279	-	186	132	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, \$ 6359.6		74	0.5	1.2
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	530	-	-	4	122	16	18	528	705	-	-
HCM Lane V/C Ratio	0.077	-	-	24.176	0.739	0.962	0.855	0.427	0.206	-	-
HCM Control Delay (s)	12.4	-	-	\$ 12200.9	90.9\$	533.5\$	451.6	16.8	11.4	-	-
HCM Lane LOS	B	-	-	F	F	F	F	C	B	-	-
HCM 95th %tile Q(veh)	0.2	-	-	14.2	4.2	2.4	2.2	2.1	0.8	-	-

Notes											
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon					

HCM 2010 Signalized Intersection Summary

2: Jedburg Road & I-26 EB Ramps

2043 Alt 3 Build Conditions

PM Peak Hour


















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↩	↩					↩↩	↩	↩	↩↩	
Traffic Volume (veh/h)	74	3	125	0	0	0	0	476	627	194	1137	0
Future Volume (veh/h)	74	3	125	0	0	0	0	476	627	194	1137	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1597	1597				0	1776	1776	1776	1776	0
Adj Flow Rate, veh/h	78	3	132				0	501	660	204	1197	0
Adj No. of Lanes	0	1	1				0	2	1	1	2	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	19	19	19				0	7	7	7	7	0
Cap, veh/h	195	8	181				0	1798	804	445	2354	0
Arrive On Green	0.13	0.13	0.13				0.00	0.53	0.53	0.08	0.70	0.00
Sat Flow, veh/h	1467	56	1357				0	3463	1509	1691	3463	0
Grp Volume(v), veh/h	81	0	132				0	501	660	204	1197	0
Grp Sat Flow(s),veh/h/ln	1523	0	1357				0	1687	1509	1691	1687	0
Q Serve(g_s), s	3.5	0.0	6.6				0.0	5.8	25.7	3.5	11.8	0.0
Cycle Q Clear(g_c), s	3.5	0.0	6.6				0.0	5.8	25.7	3.5	11.8	0.0
Prop In Lane	0.96		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	203	0	181				0	1798	804	445	2354	0
V/C Ratio(X)	0.40	0.00	0.73				0.00	0.28	0.82	0.46	0.51	0.00
Avail Cap(c_a), veh/h	344	0	306				0	2093	936	595	2949	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	28.2	0.0	29.5				0.0	9.1	13.7	6.0	5.0	0.0
Incr Delay (d2), s/veh	1.3	0.0	5.6				0.0	0.1	5.2	0.7	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	2.8				0.0	2.7	11.8	1.7	5.4	0.0
LnGrp Delay(d),s/veh	29.4	0.0	35.1				0.0	9.2	18.9	6.7	5.2	0.0
LnGrp LOS	C		D					A	B	A	A	
Approach Vol, veh/h		213						1161			1401	
Approach Delay, s/veh		33.0						14.7			5.4	
Approach LOS		C						B			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	11.7	43.8		15.4		55.5						
Change Period (Y+Rc), s	6.0	6.0		6.0		6.0						
Max Green Setting (Gmax), s	12.0	44.0		16.0		62.0						
Max Q Clear Time (g_c+I1), s	5.5	27.7		8.6		13.8						
Green Ext Time (p_c), s	0.3	9.6		1.0		35.7						
Intersection Summary												
HCM 2010 Ctrl Delay			11.4									
HCM 2010 LOS			B									

HCM 2010 Signalized Intersection Summary

3: Jedburg Road & I-26 WB Ramps










2043 Alt 3 Build Conditions

PM Peak Hour

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (veh/h)	0	0	0	0	0	355	107	443	0	0	529	91	
Future Volume (veh/h)	0	0	0	0	0	355	107	443	0	0	529	91	
Number				3	8	18	5	2	12	1	6	16	
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00	
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Adj Sat Flow, veh/h/ln				0	0	1792	1776	1776	0	0	1776	1776	
Adj Flow Rate, veh/h				0	0	374	113	466	0	0	557	0	
Adj No. of Lanes				0	0	1	1	2	0	0	2	1	
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Percent Heavy Veh, %				0	0	6	7	7	0	0	7	7	
Cap, veh/h				0	0	0	731	2761	0	0	1884	843	
Arrive On Green				0.00	0.00	0.00	0.08	0.82	0.00	0.00	0.56	0.00	
Sat Flow, veh/h					0		1691	3463	0	0	3463	1509	
Grp Volume(v), veh/h					0.0		113	466	0	0	557	0	
Grp Sat Flow(s),veh/h/ln							1691	1687	0	0	1687	1509	
Q Serve(g_s), s							0.7	1.0	0.0	0.0	2.9	0.0	
Cycle Q Clear(g_c), s							0.7	1.0	0.0	0.0	2.9	0.0	
Prop In Lane							1.00		0.00	0.00		1.00	
Lane Grp Cap(c), veh/h							731	2761	0	0	1884	843	
V/C Ratio(X)							0.15	0.17	0.00	0.00	0.30	0.00	
Avail Cap(c_a), veh/h							1316	6335	0	0	4291	1920	
HCM Platoon Ratio							1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)							1.00	1.00	0.00	0.00	1.00	0.00	
Uniform Delay (d), s/veh							2.0	0.6	0.0	0.0	3.9	0.0	
Incr Delay (d2), s/veh							0.1	0.0	0.0	0.0	0.1	0.0	
Initial Q Delay(d3),s/veh							0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln							0.3	0.4	0.0	0.0	1.3	0.0	
LnGrp Delay(d),s/veh							2.1	0.7	0.0	0.0	3.9	0.0	
LnGrp LOS							A	A			A		
Approach Vol, veh/h								579			557		
Approach Delay, s/veh								0.9			3.9		
Approach LOS								A			A		
Timer	1	2	3	4	5	6	7	8					
Assigned Phs		2			5	6							
Phs Duration (G+Y+Rc), s		33.0			8.6	24.4							
Change Period (Y+Rc), s		6.0			6.0	6.0							
Max Green Setting (Gmax), s		62.0			14.0	42.0							
Max Q Clear Time (g_c+I1), s		3.0			2.7	4.9							
Green Ext Time (p_c), s		12.8			0.2	13.6							
Intersection Summary													
HCM 2010 Ctrl Delay	2.4												
HCM 2010 LOS	A												

HCM 2010 TWSC
4: Jedburg Road & Drop Off Drive

2043 Alt 3 Build Conditions
PM Peak Hour

Intersection												
Int Delay, s/veh	11.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	36	10	105	88	10	33	91	649	58	18	427	76
Future Vol, veh/h	36	10	105	88	10	33	91	649	58	18	427	76
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	175	-	-	200	-	200	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	8	8	8	8	8	8	7	7	7	7	7	7
Mvmt Flow	39	11	113	95	11	35	98	698	62	19	459	82

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1089	1494	271	1167	1473	349	541	0	0	760	0	0
Stage 1	538	538	-	894	894	-	-	-	-	-	-	-
Stage 2	551	956	-	273	579	-	-	-	-	-	-	-
Critical Hdwy	7.66	6.66	7.06	7.66	6.66	7.06	4.24	-	-	4.24	-	-
Critical Hdwy Stg 1	6.66	5.66	-	6.66	5.66	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.66	5.66	-	6.66	5.66	-	-	-	-	-	-	-
Follow-up Hdwy	3.58	4.08	3.38	3.58	4.08	3.38	2.27	-	-	2.27	-	-
Pot Cap-1 Maneuver	162	115	709	142	119	630	990	-	-	816	-	-
Stage 1	480	506	-	290	344	-	-	-	-	-	-	-
Stage 2	471	321	-	693	484	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	128	101	709	100	105	630	990	-	-	816	-	-
Mov Cap-2 Maneuver	128	101	-	100	105	-	-	-	-	-	-	-
Stage 1	432	494	-	261	310	-	-	-	-	-	-	-
Stage 2	387	289	-	557	473	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	22.5		109.4		1		0.3	
HCM LOS	C		F					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	990	-	-	128	465	100	291	816	-	-
HCM Lane V/C Ratio	0.099	-	-	0.302	0.266	0.946	0.159	0.024	-	-
HCM Control Delay (s)	9	-	-	44.9	15.5	153.3	19.7	9.5	-	-
HCM Lane LOS	A	-	-	E	C	F	C	A	-	-
HCM 95th %tile Q(veh)	0.3	-	-	1.2	1.1	5.6	0.6	0.1	-	-



















Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕		↕	↕↕			↕↕	↕
Traffic Vol, veh/h	0	0	0	0	9	1	132	595	6	0	690	83
Future Vol, veh/h	0	0	0	0	9	1	132	595	6	0	690	83
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	-	-	-	-	0	-	-	-	-	150
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	90	94	90	90	90	94	94	90	90	94	94
Heavy Vehicles, %	7	7	7	7	7	7	11	11	11	11	11	11
Mvmt Flow	0	0	0	0	10	1	140	633	7	0	734	88
Major/Minor				Minor1		Major1		Major2				
Conflicting Flow All				1284	1651	320	734	0	0	-	-	0
Stage 1				917	917	-	-	-	-	-	-	-
Stage 2				367	734	-	-	-	-	-	-	-
Critical Hdwy				6.94	6.64	7.04	4.32	-	-	-	-	-
Critical Hdwy Stg 1				5.94	5.64	-	-	-	-	-	-	-
Critical Hdwy Stg 2				5.94	5.64	-	-	-	-	-	-	-
Follow-up Hdwy				3.57	4.07	3.37	2.31	-	-	-	-	-
Pot Cap-1 Maneuver				150	93	661	810	-	-	0	-	0
Stage 1				338	338	-	-	-	-	0	-	0
Stage 2				657	412	-	-	-	-	0	-	0
Platoon blocked, %								-	-		-	
Mov Cap-1 Maneuver				124	0	661	810	-	-	-	-	-
Mov Cap-2 Maneuver				124	0	-	-	-	-	-	-	-
Stage 1				280	0	-	-	-	-	-	-	-
Stage 2				657	0	-	-	-	-	-	-	-
Approach				WB		NB		SB				
HCM Control Delay, s				10.5		1.9		0				
HCM LOS				B								
Minor Lane/Major Mvmt		NBL	NBT	NBRWBLn1		SBT						
Capacity (veh/h)		810	-	-	661	-						
HCM Lane V/C Ratio		0.173	-	-	0.017	-						
HCM Control Delay (s)		10.4	-	-	10.5	-						
HCM Lane LOS		B	-	-	B	-						
HCM 95th %tile Q(veh)		0.6	-	-	0.1	-						




HCM 2010 Signalized Intersection Summary

8: I-26 EB Ramp & SC 27

2043 Alt 3 Build Conditions

PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	0	161	0	0	0	0	323	250	453	543	0
Future Volume (veh/h)	30	0	161	0	0	0	0	323	250	453	543	0
Number	3	8	18				1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1759	1759				0	1776	1900	1776	1776	0
Adj Flow Rate, veh/h	33	0	0				0	359	0	503	603	0
Adj No. of Lanes	0	1	1				0	2	0	1	2	0
Peak Hour Factor	0.90	0.90	0.90				0.91	0.90	0.90	0.90	0.90	0.91
Percent Heavy Veh, %	8	8	8				0	7	7	7	7	0
Cap, veh/h	52	0	46				0	811	0	777	2222	0
Arrive On Green	0.03	0.00	0.00				0.00	0.24	0.00	0.26	0.66	0.00
Sat Flow, veh/h	1675	0	1495				0	3551	0	1691	3463	0
Grp Volume(v), veh/h	33	0	0				0	359	0	503	603	0
Grp Sat Flow(s),veh/h/ln	1675	0	1495				0	1687	0	1691	1687	0
Q Serve(g_s), s	0.8	0.0	0.0				0.0	3.5	0.0	7.3	2.9	0.0
Cycle Q Clear(g_c), s	0.8	0.0	0.0				0.0	3.5	0.0	7.3	2.9	0.0
Prop In Lane	1.00		1.00				0.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	52	0	46				0	811	0	777	2222	0
V/C Ratio(X)	0.64	0.00	0.00				0.00	0.44	0.00	0.65	0.27	0.00
Avail Cap(c_a), veh/h	694	0	619				0	1397	0	988	3230	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	0.00				0.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	18.5	0.0	0.0				0.0	12.5	0.0	6.3	2.7	0.0
Incr Delay (d2), s/veh	12.3	0.0	0.0				0.0	0.4	0.0	1.0	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.0				0.0	1.6	0.0	3.4	1.3	0.0
LnGrp Delay(d),s/veh	30.8	0.0	0.0				0.0	12.9	0.0	7.2	2.8	0.0
LnGrp LOS	C							B		A	A	
Approach Vol, veh/h		33						359			1106	
Approach Delay, s/veh		30.8						12.9			4.8	
Approach LOS		C						B			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		31.5			16.2	15.3		7.2				
Change Period (Y+Rc), s		6.0			6.0	6.0		6.0				
Max Green Setting (Gmax), s		37.0			15.0	16.0		16.0				
Max Q Clear Time (g_c+I1), s		4.9			9.3	5.5		2.8				
Green Ext Time (p_c), s		13.1			0.9	3.8		0.2				
Intersection Summary												
HCM 2010 Ctrl Delay			7.3									
HCM 2010 LOS			A									




Intersection						
Int Delay, s/veh	0.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	6	6	568	10	12	691
Future Vol, veh/h	6	6	568	10	12	691
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	16	16	16	16
Mvmt Flow	7	7	624	11	13	759
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	1036	318	0	0	635	0
Stage 1	630	-	-	-	-	-
Stage 2	406	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.42	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.36	-
Pot Cap-1 Maneuver	227	678	-	-	855	-
Stage 1	493	-	-	-	-	-
Stage 2	641	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	221	678	-	-	855	-
Mov Cap-2 Maneuver	221	-	-	-	-	-
Stage 1	493	-	-	-	-	-
Stage 2	624	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	16.3	0		0.3		
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	333	855	-	
HCM Lane V/C Ratio	-	-	0.04	0.015	-	
HCM Control Delay (s)	-	-	16.3	9.3	0.1	
HCM Lane LOS	-	-	C	A	A	
HCM 95th %tile Q(veh)	-	-	0.1	0	-	

Intersection												
Int Delay, s/veh	5.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	8	3	28	126	11	21	25	157	36	21	178	15
Future Vol, veh/h	8	3	28	126	11	21	25	157	36	21	178	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	8	8	8	8	8	8	24	24	24	24	24	24
Mvmt Flow	9	3	31	138	12	23	27	173	40	23	196	16




Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	515	517	204	514	505	193	212	0	0	213	0	0
Stage 1	250	250	-	247	247	-	-	-	-	-	-	-
Stage 2	265	267	-	267	258	-	-	-	-	-	-	-
Critical Hdwy	7.18	6.58	6.28	7.18	6.58	6.28	4.34	-	-	4.34	-	-
Critical Hdwy Stg 1	6.18	5.58	-	6.18	5.58	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.18	5.58	-	6.18	5.58	-	-	-	-	-	-	-
Follow-up Hdwy	3.572	4.072	3.372	3.572	4.072	3.372	2.416	-	-	2.416	-	-
Pot Cap-1 Maneuver	461	454	822	462	461	833	1238	-	-	1237	-	-
Stage 1	741	689	-	744	691	-	-	-	-	-	-	-
Stage 2	727	677	-	725	683	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	424	434	822	427	440	833	1238	-	-	1237	-	-
Mov Cap-2 Maneuver	424	434	-	427	440	-	-	-	-	-	-	-
Stage 1	722	675	-	725	674	-	-	-	-	-	-	-
Stage 2	677	660	-	680	669	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	10.9		17.6		0.9		0.8	
HCM LOS	B		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1238	-	-	652	458	1237	-
HCM Lane V/C Ratio	0.022	-	-	0.066	0.379	0.019	-
HCM Control Delay (s)	8	0	-	10.9	17.6	8	0
HCM Lane LOS	A	A	-	B	C	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0.2	1.7	0.1	-

























Intersection												
Int Delay, s/veh	4.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	95	0	103	34	115	0	0	297	35
Future Vol, veh/h	0	0	0	95	0	103	34	115	0	0	297	35
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	21	21	21	21	21	21	24	24	24	24	24	24
Mvmt Flow	0	0	0	106	0	114	38	128	0	0	330	39
Major/Minor				Minor1		Major1		Major2				
Conflicting Flow All				554	573	128	369	0	-	-	-	0
Stage 1				204	204	-	-	-	-	-	-	-
Stage 2				350	369	-	-	-	-	-	-	-
Critical Hdwy				6.61	6.71	6.41	4.34	-	-	-	-	-
Critical Hdwy Stg 1				5.61	5.71	-	-	-	-	-	-	-
Critical Hdwy Stg 2				5.61	5.71	-	-	-	-	-	-	-
Follow-up Hdwy				3.689	4.189	3.489	2.416	-	-	-	-	-
Pot Cap-1 Maneuver				462	405	874	1078	-	0	0	-	-
Stage 1				787	699	-	-	-	0	0	-	-
Stage 2				673	589	-	-	-	0	0	-	-
Platoon blocked, %								-			-	-
Mov Cap-1 Maneuver				444	0	874	1078	-	-	-	-	-
Mov Cap-2 Maneuver				444	0	-	-	-	-	-	-	-
Stage 1				757	0	-	-	-	-	-	-	-
Stage 2				673	0	-	-	-	-	-	-	-
Approach				WB		NB		SB				
HCM Control Delay, s				14.5		1.9		0				
HCM LOS				B								
Minor Lane/Major Mvmt		NBL	NBTWBLn1	SBT	SBR							
Capacity (veh/h)		1078	-	597	-	-						
HCM Lane V/C Ratio		0.035	-	0.369	-	-						
HCM Control Delay (s)		8.5	0	14.5	-	-						
HCM Lane LOS		A	A	B	-	-						
HCM 95th %tile Q(veh)		0.1	-	1.7	-	-						

Intersection												
Int Delay, s/veh	2.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Traffic Vol, veh/h	13	0	24	0	0	0	0	136	66	128	264	0
Future Vol, veh/h	13	0	24	0	0	0	0	136	66	128	264	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	52	52	52	52	52	52	24	24	24	24	24	24
Mvmt Flow	14	0	27	0	0	0	0	151	73	142	293	0
Major/Minor	Minor2						Major1			Major2		
Conflicting Flow All	765	801	293				-	0	0	224	0	0
Stage 1	577	577	-				-	-	-	-	-	-
Stage 2	188	224	-				-	-	-	-	-	-
Critical Hdwy	6.92	7.02	6.72				-	-	-	4.34	-	-
Critical Hdwy Stg 1	5.92	6.02	-				-	-	-	-	-	-
Critical Hdwy Stg 2	5.92	6.02	-				-	-	-	-	-	-
Follow-up Hdwy	3.968	4.468	3.768				-	-	-	2.416	-	-
Pot Cap-1 Maneuver	309	267	642				0	-	-	1225	-	0
Stage 1	475	430	-				0	-	-	-	-	0
Stage 2	737	635	-				0	-	-	-	-	0
Platoon blocked, %								-	-		-	
Mov Cap-1 Maneuver	266	0	642				-	-	-	1225	-	-
Mov Cap-2 Maneuver	266	0	-				-	-	-	-	-	-
Stage 1	475	0	-				-	-	-	-	-	-
Stage 2	635	0	-				-	-	-	-	-	-
Approach	EB						NB			SB		
HCM Control Delay, s	14.3						0			2.7		
HCM LOS	B											
Minor Lane/Major Mvmt		NBT	NBR	EBLn1	SBL	SBT						
Capacity (veh/h)		-	-	429	1225	-						
HCM Lane V/C Ratio		-	-	0.096	0.116	-						
HCM Control Delay (s)		-	-	14.3	8.3	0						
HCM Lane LOS		-	-	B	A	A						
HCM 95th %tile Q(veh)		-	-	0.3	0.4	-						

Intersection						
Int Delay, s/veh	8.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	43	106	146	159	209	79
Future Vol, veh/h	43	106	146	159	209	79
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	6	6	24	24	24	24
Mvmt Flow	48	118	162	177	232	88
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	339	0	-	0	465	251
Stage 1	-	-	-	-	251	-
Stage 2	-	-	-	-	214	-
Critical Hdwy	4.16	-	-	-	6.64	6.44
Critical Hdwy Stg 1	-	-	-	-	5.64	-
Critical Hdwy Stg 2	-	-	-	-	5.64	-
Follow-up Hdwy	2.254	-	-	-	3.716	3.516
Pot Cap-1 Maneuver	1198	-	-	-	517	737
Stage 1	-	-	-	-	742	-
Stage 2	-	-	-	-	772	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1198	-	-	-	495	737
Mov Cap-2 Maneuver	-	-	-	-	495	-
Stage 1	-	-	-	-	710	-
Stage 2	-	-	-	-	772	-
Approach	EB	WB		SB		
HCM Control Delay, s	2.3	0		20.6		
HCM LOS				C		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1198	-	-	-	544	
HCM Lane V/C Ratio	0.04	-	-	-	0.588	
HCM Control Delay (s)	8.1	0	-	-	20.6	
HCM Lane LOS	A	A	-	-	C	
HCM 95th %tile Q(veh)	0.1	-	-	-	3.8	

HCM 2010 Signalized Intersection Summary
15: Volvo Car Drive & Welcome Center/Factory Entrance

2043 Alt 3 Build Conditions
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	56	0	171	15	0	4	32	386	15	4	593	12
Future Volume (veh/h)	56	0	171	15	0	4	32	386	15	4	593	12
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727
Adj Flow Rate, veh/h	61	0	186	16	0	4	35	420	16	4	645	13
Adj No. of Lanes	1	1	1	1	1	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	10	10	10	10	10	10	10	10	10	10	10	10
Cap, veh/h	387	281	239	312	230	196	189	612	520	275	567	482
Arrive On Green	0.05	0.00	0.16	0.02	0.00	0.13	0.03	0.35	0.35	0.00	0.33	0.33
Sat Flow, veh/h	1645	1727	1468	1645	1727	1468	1645	1727	1468	1645	1727	1468
Grp Volume(v), veh/h	61	0	186	16	0	4	35	420	16	4	645	13
Grp Sat Flow(s),veh/h/ln	1645	1727	1468	1645	1727	1468	1645	1727	1468	1645	1727	1468
Q Serve(g_s), s	1.6	0.0	6.3	0.4	0.0	0.1	0.7	10.8	0.4	0.1	17.0	0.3
Cycle Q Clear(g_c), s	1.6	0.0	6.3	0.4	0.0	0.1	0.7	10.8	0.4	0.1	17.0	0.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	387	281	239	312	230	196	189	612	520	275	567	482
V/C Ratio(X)	0.16	0.00	0.78	0.05	0.00	0.02	0.19	0.69	0.03	0.01	1.14	0.03
Avail Cap(c_a), veh/h	598	533	453	572	533	453	425	612	520	554	567	482
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.2	0.0	20.8	18.9	0.0	19.5	13.7	14.3	10.9	12.4	17.4	11.8
Incr Delay (d2), s/veh	0.2	0.0	5.5	0.1	0.0	0.0	0.5	3.2	0.0	0.0	82.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	2.9	0.2	0.0	0.1	0.3	5.6	0.2	0.0	20.8	0.1
LnGrp Delay(d),s/veh	18.4	0.0	26.3	19.0	0.0	19.6	14.1	17.5	10.9	12.5	99.5	11.8
LnGrp LOS	B		C	B		B	B	B	B	B	F	B
Approach Vol, veh/h	247					20		471		662		
Approach Delay, s/veh	24.3					19.1		17.0		97.3		
Approach LOS	C					B		B		F		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.6	23.0	8.3	12.9	6.2	24.4	6.8	14.4				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	9.0	17.0	9.0	16.0	9.0	17.0	9.0	16.0				
Max Q Clear Time (g_c+I1), s	2.7	19.0	3.6	2.1	2.1	12.8	2.4	8.3				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	2.2	0.0	0.4				
Intersection Summary												
HCM 2010 Ctrl Delay			56.3									
HCM 2010 LOS			E									










June 2019

D.10 2023 BUILD – ALTERNATIVE 4



HCM 2010 TWSC
1: Jedburg Road & Old Dairy Road

2023 Alt 4 Build Conditions
AM Peak Hour

Intersection												
Int Delay, s/veh	22.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	85	3	37	9	6	88	30	728	19	125	489	94
Future Vol, veh/h	85	3	37	9	6	88	30	728	19	125	489	94
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Yield	-	-	None	-	-	None
Storage Length	0	-	250	150	-	150	150	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	34	34	34	34	34	34	11	11	11	11	11	11
Mvmt Flow	89	3	39	9	6	93	32	766	20	132	515	99

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1279	1679	307	1363	1718	393	614	0	0	786	0	0
Stage 1	829	829	-	840	840	-	-	-	-	-	-	-
Stage 2	450	850	-	523	878	-	-	-	-	-	-	-
Critical Hdwy	8.18	7.18	7.58	8.18	7.18	7.58	4.32	-	-	4.32	-	-
Critical Hdwy Stg 1	7.18	6.18	-	7.18	6.18	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7.18	6.18	-	7.18	6.18	-	-	-	-	-	-	-
Follow-up Hdwy	3.84	4.34	3.64	3.84	4.34	3.64	2.31	-	-	2.31	-	-
Pot Cap-1 Maneuver	94	68	603	80	64	524	903	-	-	773	-	-
Stage 1	270	316	-	266	312	-	-	-	-	-	-	-
Stage 2	481	308	-	431	298	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 60	54	603	61	51	524	903	-	-	773	-	-
Mov Cap-2 Maneuver	~ 60	54	-	61	51	-	-	-	-	-	-	-
Stage 1	261	262	-	257	301	-	-	-	-	-	-	-
Stage 2	374	297	-	330	247	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	280.6		22.9		0.4		1.9	
HCM LOS	F		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	903	-	-	60	342	61	51	524	773	-	-
HCM Lane V/C Ratio	0.035	-	-	1.491	0.123	0.155	0.124	0.177	0.17	-	-
HCM Control Delay (s)	9.1	-	-	\$ 404.6	17	74.6	85.3	13.3	10.6	-	-
HCM Lane LOS	A	-	-	F	C	F	F	B	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	7.9	0.4	0.5	0.4	0.6	0.6	-	-




















Notes											
-: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined				*: All major volume in platoon			

HCM 2010 Signalized Intersection Summary

2: Jedburg Road & I-26 EB Ramps

2023 Alt 4 Build Conditions

AM Peak Hour


















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	0	123	0	0	0	0	315	586	278	585	0
Future Volume (veh/h)	22	0	123	0	0	0	0	315	586	278	585	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1473	1473				0	1712	1712	1712	1712	0
Adj Flow Rate, veh/h	23	0	129				0	332	617	293	616	0
Adj No. of Lanes	0	1	1				0	2	1	1	2	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	29	29	29				0	11	11	11	11	0
Cap, veh/h	179	0	160				0	1628	728	527	2275	0
Arrive On Green	0.13	0.00	0.13				0.00	0.50	0.50	0.11	0.70	0.00
Sat Flow, veh/h	1403	0	1252				0	3338	1455	1630	3338	0
Grp Volume(v), veh/h	23	0	129				0	332	617	293	616	0
Grp Sat Flow(s),veh/h/ln	1403	0	1252				0	1626	1455	1630	1626	0
Q Serve(g_s), s	1.0	0.0	7.0				0.0	3.9	25.5	5.4	4.9	0.0
Cycle Q Clear(g_c), s	1.0	0.0	7.0				0.0	3.9	25.5	5.4	4.9	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	179	0	160				0	1628	728	527	2275	0
V/C Ratio(X)	0.13	0.00	0.81				0.00	0.20	0.85	0.56	0.27	0.00
Avail Cap(c_a), veh/h	323	0	289				0	2062	922	626	2905	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	26.9	0.0	29.5				0.0	9.6	15.0	6.0	3.9	0.0
Incr Delay (d2), s/veh	0.3	0.0	9.3				0.0	0.1	6.0	0.9	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	2.8				0.0	1.8	11.3	2.5	2.2	0.0
LnGrp Delay(d),s/veh	27.2	0.0	38.7				0.0	9.7	21.1	6.9	3.9	0.0
LnGrp LOS	C		D					A	C	A	A	
Approach Vol, veh/h		152						949			909	
Approach Delay, s/veh		37.0						17.1			4.9	
Approach LOS		D						B			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	13.8	40.8		14.8		54.6						
Change Period (Y+Rc), s	6.0	6.0		6.0		6.0						
Max Green Setting (Gmax), s	12.0	44.0		16.0		62.0						
Max Q Clear Time (g_c+I1), s	7.4	27.5		9.0		6.9						
Green Ext Time (p_c), s	0.4	7.2		0.4		17.8						
Intersection Summary												
HCM 2010 Ctrl Delay			13.1									
HCM 2010 LOS			B									

HCM 2010 Signalized Intersection Summary

3: Jedburg Road & I-26 WB Ramps











2023 Alt 4 Build Conditions




AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	0	152	66	271	0	0	547	85
Future Volume (veh/h)	0	0	0	0	0	152	66	271	0	0	547	85
Number				3	8	18	5	2	12	1	6	16
Initial Q (Ob), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				0	0	1727	1712	1712	0	0	1712	1712
Adj Flow Rate, veh/h				0	0	160	69	285	0	0	576	0
Adj No. of Lanes				0	0	1	1	2	0	0	2	1
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				0	0	10	11	11	0	0	11	11
Cap, veh/h				0	0	0	685	2660	0	0	1883	842
Arrive On Green				0.00	0.00	0.00	0.06	0.82	0.00	0.00	0.58	0.00
Sat Flow, veh/h					0		1630	3338	0	0	3338	1455
Grp Volume(v), veh/h					0.0		69	285	0	0	576	0
Grp Sat Flow(s),veh/h/ln							1630	1626	0	0	1626	1455
Q Serve(g_s), s							0.4	0.6	0.0	0.0	3.0	0.0
Cycle Q Clear(g_c), s							0.4	0.6	0.0	0.0	3.0	0.0
Prop In Lane							1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h							685	2660	0	0	1883	842
V/C Ratio(X)							0.10	0.11	0.00	0.00	0.31	0.00
Avail Cap(c_a), veh/h							1285	6121	0	0	4146	1855
HCM Platoon Ratio							1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)							1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh							2.0	0.6	0.0	0.0	3.5	0.0
Incr Delay (d2), s/veh							0.1	0.0	0.0	0.0	0.1	0.0
Initial Q Delay(d3),s/veh							0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln							0.2	0.2	0.0	0.0	1.3	0.0
LnGrp Delay(d),s/veh							2.1	0.6	0.0	0.0	3.6	0.0
LnGrp LOS							A	A			A	
Approach Vol, veh/h								354			576	
Approach Delay, s/veh								0.9			3.6	
Approach LOS								A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6						
Phs Duration (G+Y+Rc), s		32.9			7.9	25.1						
Change Period (Y+Rc), s		6.0			6.0	6.0						
Max Green Setting (Gmax), s		62.0			14.0	42.0						
Max Q Clear Time (g_c+I1), s		2.6			2.4	5.0						
Green Ext Time (p_c), s		7.2			0.1	14.1						
Intersection Summary												
HCM 2010 Ctrl Delay			2.6									
HCM 2010 LOS			A									

HCM 2010 TWSC
4: Jedburg Road & Drop Off Drive




2023 Alt 4 Build Conditions
AM Peak Hour

Intersection												
Int Delay, s/veh	4.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	33	9	94	49	14	14	55	305	63	18	489	55
Future Vol, veh/h	33	9	94	49	14	14	55	305	63	18	489	55
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	175	-	-	200	-	200	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	22	22	22	22	22	22	11	11	11	11	11	11
Mvmt Flow	35	10	100	52	15	15	59	324	67	19	520	59
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	876	1097	290	745	1059	162	579	0	0	391	0	0
Stage 1	588	588	-	442	442	-	-	-	-	-	-	-
Stage 2	288	509	-	303	617	-	-	-	-	-	-	-
Critical Hdwy	7.94	6.94	7.34	7.94	6.94	7.34	4.32	-	-	4.32	-	-
Critical Hdwy Stg 1	6.94	5.94	-	6.94	5.94	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.94	5.94	-	6.94	5.94	-	-	-	-	-	-	-
Follow-up Hdwy	3.72	4.22	3.52	3.72	4.22	3.52	2.31	-	-	2.31	-	-
Pot Cap-1 Maneuver	213	183	650	268	193	795	931	-	-	1102	-	-
Stage 1	416	447	-	514	527	-	-	-	-	-	-	-
Stage 2	642	489	-	628	433	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	184	169	650	204	178	795	931	-	-	1102	-	-
Mov Cap-2 Maneuver	184	169	-	204	178	-	-	-	-	-	-	-
Stage 1	390	439	-	482	494	-	-	-	-	-	-	-
Stage 2	572	458	-	511	426	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	17.4			25			1.2			0.3		
HCM LOS	C			D								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR		
Capacity (veh/h)	931	-	-	184	521	204	291	1102	-	-		
HCM Lane V/C Ratio	0.063	-	-	0.191	0.21	0.256	0.102	0.017	-	-		
HCM Control Delay (s)	9.1	-	-	29.1	13.7	28.6	18.8	8.3	-	-		
HCM Lane LOS	A	-	-	D	B	D	C	A	-	-		
HCM 95th %tile Q(veh)	0.2	-	-	0.7	0.8	1	0.3	0.1	-	-		

Intersection						
Int Delay, s/veh	0					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	0	415	1	0	379
Future Vol, veh/h	2	0	415	1	0	379
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	16	16	16	16
Mvmt Flow	2	0	461	1	0	421
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	673	231	0	0	462	0
Stage 1	462	-	-	-	-	-
Stage 2	211	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.42	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.36	-
Pot Cap-1 Maneuver	389	771	-	-	1003	-
Stage 1	601	-	-	-	-	-
Stage 2	804	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	389	771	-	-	1003	-
Mov Cap-2 Maneuver	389	-	-	-	-	-
Stage 1	601	-	-	-	-	-
Stage 2	804	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	14.3	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	- 389		1003	-	
HCM Lane V/C Ratio	-	- 0.006		-	-	
HCM Control Delay (s)	-	- 14.3		0	-	
HCM Lane LOS	-	- B		A	-	
HCM 95th %tile Q(veh)	-	- 0		0	-	

Intersection

Int Delay, s/veh 0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	1	0	415	378	3
Future Vol, veh/h	1	1	0	415	378	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	50	50	16	16	16	16
Mvmt Flow	1	1	0	456	415	3

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	645	209	418
Stage 1	417	-	-
Stage 2	228	-	-
Critical Hdwy	7.8	7.9	4.42
Critical Hdwy Stg 1	6.8	-	-
Critical Hdwy Stg 2	6.8	-	-
Follow-up Hdwy	4	3.8	2.36
Pot Cap-1 Maneuver	312	667	1044
Stage 1	512	-	-
Stage 2	662	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	312	667	1044
Mov Cap-2 Maneuver	312	-	-
Stage 1	512	-	-
Stage 2	662	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.5	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1044	-	425	-	-
HCM Lane V/C Ratio	-	-	0.005	-	-
HCM Control Delay (s)	0	-	13.5	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

MOVEMENT SUMMARY

 Site: 2023_AM

I-26 WB & SC 27
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: SC 27											
3	L2	101	16.0	0.104	4.6	LOS A	0.0	0.0	0.00	0.00	33.3
8	T1	227	16.0	0.233	6.0	LOS A	0.0	0.0	0.00	0.00	40.2
Approach		328	16.0	0.233	5.6	LOS A	0.0	0.0	0.00	0.00	37.8
East: I-26 WB Off-Ramp											
1	L2	183	23.0	0.263	8.2	LOS A	0.6	18.3	0.36	0.33	27.1
6	T1	2	23.0	0.263	8.2	LOS A	0.6	18.3	0.36	0.33	25.6
16	R2	215	23.0	0.158	0.0	LOS A	0.0	0.0	0.00	0.00	29.3
Approach		400	23.0	0.263	3.8	LOS A	0.6	18.3	0.17	0.15	28.2
North: SC 27											
4	T1	382	16.0	0.277	8.6	LOS A	0.9	26.6	0.47	0.41	34.9
14	R2	21	16.0	0.015	0.0	LOS A	0.0	0.0	0.00	0.00	39.4
Approach		403	16.0	0.277	8.1	LOS A	0.9	26.6	0.44	0.39	35.1
All Vehicles		1131	18.5	0.277	5.9	LOS A	0.9	26.6	0.22	0.19	32.9

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 Site: 2023_AM

I-26 EB & SC 27
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: SC 27											
8	T1	299	16.0	0.222	8.0	LOS A	0.7	20.4	0.46	0.41	35.2
18	R2	284	16.0	0.196	0.0	LOS A	0.0	0.0	0.00	0.00	36.1
Approach		582	16.0	0.222	4.1	LOS A	0.7	20.4	0.24	0.21	35.6
North: SC 27											
7	L2	274	16.0	0.281	6.5	LOS A	0.0	0.0	0.00	0.00	34.1
4	T1	310	16.0	0.318	7.0	LOS A	0.0	0.0	0.00	0.00	40.2
Approach		584	16.0	0.318	6.8	LOS A	0.0	0.0	0.00	0.00	37.0
West: I-26 EB Off-Ramp											
5	L2	40	23.0	0.071	7.1	LOS A	0.1	4.3	0.42	0.40	30.7
2	T1	1	23.0	0.071	7.1	LOS A	0.1	4.3	0.42	0.40	31.0
12	R2	91	23.0	0.067	0.0	LOS A	0.0	0.0	0.00	0.00	36.2
Approach		132	23.0	0.071	2.2	LOS A	0.1	4.3	0.13	0.12	34.2
All Vehicles		1298	16.7	0.318	5.1	LOS A	0.7	20.4	0.12	0.11	36.1

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).




Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	5	525	1	1	362
Future Vol, veh/h	2	5	525	1	1	362
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	16	16	16	16
Mvmt Flow	2	5	577	1	1	398
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	779	289	0	0	578	0
Stage 1	578	-	-	-	-	-
Stage 2	201	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.42	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.36	-
Pot Cap-1 Maneuver	333	708	-	-	901	-
Stage 1	524	-	-	-	-	-
Stage 2	813	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	333	708	-	-	901	-
Mov Cap-2 Maneuver	333	-	-	-	-	-
Stage 1	524	-	-	-	-	-
Stage 2	812	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	11.8	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	-	536	901	-	
HCM Lane V/C Ratio	-	-	0.014	0.001	-	
HCM Control Delay (s)	-	-	11.8	9	0	
HCM Lane LOS	-	-	B	A	A	
HCM 95th %tile Q(veh)	-	-	0	0	-	

Intersection												
Int Delay, s/veh	2.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	6	26	33	3	16	8	174	39	14	112	1
Future Vol, veh/h	6	6	26	33	3	16	8	174	39	14	112	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	23	23	23	23	23	23	36	36	36	36	36	36
Mvmt Flow	7	7	29	37	3	18	9	193	43	16	124	1
Major/Minor	Minor2		Minor1		Major1				Major2			
Conflicting Flow All	400	411	125	408	390	215	125	0	0	236	0	0
Stage 1	157	157	-	233	233	-	-	-	-	-	-	-
Stage 2	243	254	-	175	157	-	-	-	-	-	-	-
Critical Hdwy	7.33	6.73	6.43	7.33	6.73	6.43	4.46	-	-	4.46	-	-
Critical Hdwy Stg 1	6.33	5.73	-	6.33	5.73	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.33	5.73	-	6.33	5.73	-	-	-	-	-	-	-
Follow-up Hdwy	3.707	4.207	3.507	3.707	4.207	3.507	2.524	-	-	2.524	-	-
Pot Cap-1 Maneuver	525	500	872	518	514	775	1276	-	-	1155	-	-
Stage 1	798	730	-	725	675	-	-	-	-	-	-	-
Stage 2	716	660	-	780	730	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	501	489	872	487	502	775	1276	-	-	1155	-	-
Mov Cap-2 Maneuver	501	489	-	487	502	-	-	-	-	-	-	-
Stage 1	792	719	-	719	670	-	-	-	-	-	-	-
Stage 2	691	655	-	736	719	-	-	-	-	-	-	-
Approach	EB		WB		NB				SB			
HCM Control Delay, s	10.4		12.3		0.3				0.9			
HCM LOS	B		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1276	-	-	703	551	1155	-	-				
HCM Lane V/C Ratio	0.007	-	-	0.06	0.105	0.013	-	-				
HCM Control Delay (s)	7.8	0	-	10.4	12.3	8.2	0	-				
HCM Lane LOS	A	A	-	B	B	A	A	-				
HCM 95th %tile Q(veh)	0	-	-	0.2	0.3	0	-	-				




Intersection												
Int Delay, s/veh	4.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔			↔			↔	
Traffic Vol, veh/h	0	0	0	60	2	99	27	122	0	0	146	25
Future Vol, veh/h	0	0	0	60	2	99	27	122	0	0	146	25
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	46	46	46	46	46	46	36	36	36	36	36	36
Mvmt Flow	0	0	0	64	2	105	29	130	0	0	155	27

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	357	370	130	182	0	-
Stage 1	188	188	-	-	-	-
Stage 2	169	182	-	-	-	-
Critical Hdwy	6.86	6.96	6.66	4.46	-	-
Critical Hdwy Stg 1	5.86	5.96	-	-	-	-
Critical Hdwy Stg 2	5.86	5.96	-	-	-	-
Follow-up Hdwy	3.914	4.414	3.714	2.524	-	-
Pot Cap-1 Maneuver	562	496	814	1213	-	0
Stage 1	749	669	-	-	-	0
Stage 2	765	673	-	-	-	0
Platoon blocked, %					-	-
Mov Cap-1 Maneuver	547	0	814	1213	-	-
Mov Cap-2 Maneuver	547	0	-	-	-	-
Stage 1	730	0	-	-	-	-
Stage 2	765	0	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12	1.5	0
HCM LOS	B		























Minor Lane/Major Mvmt	NBL	NBTWBLn1	SBT	SBR
Capacity (veh/h)	1213	-	687	-
HCM Lane V/C Ratio	0.024	-	0.249	-
HCM Control Delay (s)	8	0	12	-
HCM Lane LOS	A	A	B	-
HCM 95th %tile Q(veh)	0.1	-	1	-

Intersection												
Int Delay, s/veh	2.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Traffic Vol, veh/h	28	2	25	0	0	0	0	121	69	71	135	0
Future Vol, veh/h	28	2	25	0	0	0	0	121	69	71	135	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	53	53	53	53	53	53	36	36	36	36	36	36
Mvmt Flow	31	2	28	0	0	0	0	134	77	79	150	0
Major/Minor	Minor2						Major1			Major2		
Conflicting Flow All	481	519	150				-	0	0	211	0	0
Stage 1	308	308	-				-	-	-	-	-	-
Stage 2	173	211	-				-	-	-	-	-	-
Critical Hdwy	6.93	7.03	6.73				-	-	-	4.46	-	-
Critical Hdwy Stg 1	5.93	6.03	-				-	-	-	-	-	-
Critical Hdwy Stg 2	5.93	6.03	-				-	-	-	-	-	-
Follow-up Hdwy	3.977	4.477	3.777				-	-	-	2.524	-	-
Pot Cap-1 Maneuver	462	396	778				0	-	-	1181	-	0
Stage 1	643	578	-				0	-	-	-	-	0
Stage 2	748	642	-				0	-	-	-	-	0
Platoon blocked, %								-	-		-	
Mov Cap-1 Maneuver	428	0	778				-	-	-	1181	-	-
Mov Cap-2 Maneuver	428	0	-				-	-	-	-	-	-
Stage 1	643	0	-				-	-	-	-	-	-
Stage 2	693	0	-				-	-	-	-	-	-
Approach	EB						NB			SB		
HCM Control Delay, s	12.5						0			2.8		
HCM LOS	B											
Minor Lane/Major Mvmt		NBT	NBR	EBLn1	SBL	SBT						
Capacity (veh/h)		-	-	543	1181	-						
HCM Lane V/C Ratio		-	-	0.113	0.067	-						
HCM Control Delay (s)		-	-	12.5	8.3	0						
HCM Lane LOS		-	-	B	A	A						
HCM 95th %tile Q(veh)		-	-	0.4	0.2	-						

Intersection						
Int Delay, s/veh	5.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	68	84	56	122	112	47
Future Vol, veh/h	68	84	56	122	112	47
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	19	19	36	36	36	36
Mvmt Flow	75	92	62	134	123	52
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	196	0	-	0	371	129
Stage 1	-	-	-	-	129	-
Stage 2	-	-	-	-	242	-
Critical Hdwy	4.29	-	-	-	6.76	6.56
Critical Hdwy Stg 1	-	-	-	-	5.76	-
Critical Hdwy Stg 2	-	-	-	-	5.76	-
Follow-up Hdwy	2.371	-	-	-	3.824	3.624
Pot Cap-1 Maneuver	1281	-	-	-	568	837
Stage 1	-	-	-	-	820	-
Stage 2	-	-	-	-	725	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1281	-	-	-	533	837
Mov Cap-2 Maneuver	-	-	-	-	533	-
Stage 1	-	-	-	-	769	-
Stage 2	-	-	-	-	725	-
Approach	EB	WB		SB		
HCM Control Delay, s	3.6	0		13.5		
HCM LOS				B		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1281	-	-	-	597	
HCM Lane V/C Ratio	0.058	-	-	-	0.293	
HCM Control Delay (s)	8	0	-	-	13.5	
HCM Lane LOS	A	A	-	-	B	
HCM 95th %tile Q(veh)	0.2	-	-	-	1.2	










HCM 2010 Signalized Intersection Summary
15: Volvo Car Drive & Welcome Center/Factory Entrance

2023 Alt 4 Build Conditions
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	0	11	24	0	11	76	197	219	72	77	26
Future Volume (veh/h)	3	0	11	24	0	11	76	197	219	72	77	26
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727
Adj Flow Rate, veh/h	3	0	12	26	0	12	83	214	238	78	84	28
Adj No. of Lanes	1	1	1	1	1	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	10	10	10	10	10	10	10	10	10	10	10	10
Cap, veh/h	226	45	38	263	83	70	555	458	390	424	454	386
Arrive On Green	0.00	0.00	0.03	0.03	0.00	0.05	0.06	0.27	0.27	0.06	0.26	0.26
Sat Flow, veh/h	1645	1727	1468	1645	1727	1468	1645	1727	1468	1645	1727	1468
Grp Volume(v), veh/h	3	0	12	26	0	12	83	214	238	78	84	28
Grp Sat Flow(s),veh/h/ln	1645	1727	1468	1645	1727	1468	1645	1727	1468	1645	1727	1468
Q Serve(g_s), s	0.1	0.0	0.3	0.6	0.0	0.3	1.4	4.0	5.5	1.3	1.4	0.6
Cycle Q Clear(g_c), s	0.1	0.0	0.3	0.6	0.0	0.3	1.4	4.0	5.5	1.3	1.4	0.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	226	45	38	263	83	70	555	458	390	424	454	386
V/C Ratio(X)	0.01	0.00	0.31	0.10	0.00	0.17	0.15	0.47	0.61	0.18	0.18	0.07
Avail Cap(c_a), veh/h	606	719	611	606	719	611	839	764	649	713	764	649
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.1	0.0	18.4	17.6	0.0	17.6	9.3	11.8	12.4	9.5	11.0	10.6
Incr Delay (d2), s/veh	0.0	0.0	4.6	0.2	0.0	1.1	0.1	0.7	1.6	0.2	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.2	0.3	0.0	0.1	0.6	2.0	2.4	0.6	0.7	0.2
LnGrp Delay(d),s/veh	18.2	0.0	23.0	17.7	0.0	18.7	9.4	12.6	13.9	9.7	11.2	10.7
LnGrp LOS	B		C	B		B	A	B	B	A	B	B
Approach Vol, veh/h	15				38		535				190	
Approach Delay, s/veh	22.0				18.0		12.7				10.5	
Approach LOS	C				B		B				B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.4	16.1	6.1	7.8	8.3	16.2	7.0	7.0				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	9.0	17.0	9.0	16.0	9.0	17.0	9.0	16.0				
Max Q Clear Time (g_c+I1), s	3.4	3.4	2.1	2.3	3.3	7.5	2.6	2.3				
Green Ext Time (p_c), s	0.1	0.9	0.0	0.0	0.1	2.7	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay	12.6											
HCM 2010 LOS	B											

HCM 2010 TWSC
1: Jedburg Road & Old Dairy Road

2023 Alt 4 Build Conditions
PM Peak Hour

Intersection												
Int Delay, s/veh	29.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	69	8	56	11	11	160	29	633	24	103	769	115
Future Vol, veh/h	69	8	56	11	11	160	29	633	24	103	769	115
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Yield	-	-	None	-	-	None
Storage Length	0	-	250	150	-	150	150	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	9	9	9	9	9	9	7	7	7	7	7	7
Mvmt Flow	76	9	62	12	12	176	32	696	26	113	845	126

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1552	1920	486	1426	1970	361	971	0	0	722	0	0
Stage 1	1134	1134	-	773	773	-	-	-	-	-	-	-
Stage 2	418	786	-	653	1197	-	-	-	-	-	-	-
Critical Hdwy	7.68	6.68	7.08	7.68	6.68	7.08	4.24	-	-	4.24	-	-
Critical Hdwy Stg 1	6.68	5.68	-	6.68	5.68	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.68	5.68	-	6.68	5.68	-	-	-	-	-	-	-
Follow-up Hdwy	3.59	4.09	3.39	3.59	4.09	3.39	2.27	-	-	2.27	-	-
Pot Cap-1 Maneuver	~ 72	61	509	90	57	616	676	-	-	844	-	-
Stage 1	204	262	-	343	391	-	-	-	-	-	-	-
Stage 2	565	385	-	406	244	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 36	50	509	59	47	616	676	-	-	844	-	-
Mov Cap-2 Maneuver	~ 36	50	-	59	47	-	-	-	-	-	-	-
Stage 1	194	227	-	327	373	-	-	-	-	-	-	-
Stage 2	372	367	-	297	211	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s\$	401.7		22.9		0.4		1	
HCM LOS	F		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	676	-	-	36	237	59	47	616	844	-	-
HCM Lane V/C Ratio	0.047	-	-	2.106	0.297	0.205	0.257	0.285	0.134	-	-
HCM Control Delay (s)	10.6	-	-	\$ 749.8	26.5	81.1	106.3	13.2	9.9	-	-
HCM Lane LOS	B	-	-	F	D	F	F	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	8.4	1.2	0.7	0.9	1.2	0.5	-	-




















Notes												
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon						

HCM 2010 Signalized Intersection Summary

2: Jedburg Road & I-26 EB Ramps

2023 Alt 4 Build Conditions

PM Peak Hour


















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	58	2	98	0	0	0	0	372	490	152	889	0
Future Volume (veh/h)	58	2	98	0	0	0	0	372	490	152	889	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1597	1597				0	1776	1776	1776	1776	0
Adj Flow Rate, veh/h	61	2	103				0	392	516	160	936	0
Adj No. of Lanes	0	1	1				0	2	1	1	2	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	19	19	19				0	7	7	7	7	0
Cap, veh/h	171	6	158				0	1655	740	501	2265	0
Arrive On Green	0.12	0.12	0.12				0.00	0.49	0.49	0.07	0.67	0.00
Sat Flow, veh/h	1475	48	1357				0	3463	1509	1691	3463	0
Grp Volume(v), veh/h	63	0	103				0	392	516	160	936	0
Grp Sat Flow(s),veh/h/ln	1523	0	1357				0	1687	1509	1691	1687	0
Q Serve(g_s), s	2.2	0.0	4.1				0.0	3.8	14.9	2.4	7.1	0.0
Cycle Q Clear(g_c), s	2.2	0.0	4.1				0.0	3.8	14.9	2.4	7.1	0.0
Prop In Lane	0.97		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	177	0	158				0	1655	740	501	2265	0
V/C Ratio(X)	0.36	0.00	0.65				0.00	0.24	0.70	0.32	0.41	0.00
Avail Cap(c_a), veh/h	486	0	433				0	2571	1150	704	3588	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	23.0	0.0	23.9				0.0	8.3	11.1	5.4	4.2	0.0
Incr Delay (d2), s/veh	1.2	0.0	4.5				0.0	0.1	1.2	0.4	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	1.7				0.0	1.8	6.4	1.1	3.3	0.0
LnGrp Delay(d),s/veh	24.2	0.0	28.4				0.0	8.4	12.3	5.7	4.3	0.0
LnGrp LOS	C		C					A	B	A	A	
Approach Vol, veh/h		166						908			1096	
Approach Delay, s/veh		26.8						10.6			4.5	
Approach LOS		C						B			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	10.2	33.7		12.5		43.9						
Change Period (Y+Rc), s	6.0	6.0		6.0		6.0						
Max Green Setting (Gmax), s	11.0	43.0		18.0		60.0						
Max Q Clear Time (g_c+I1), s	4.4	16.9		6.1		9.1						
Green Ext Time (p_c), s	0.2	9.7		1.0		28.8						
Intersection Summary												
HCM 2010 Ctrl Delay			8.8									
HCM 2010 LOS			A									

HCM 2010 Signalized Intersection Summary

3: Jedburg Road & I-26 WB Ramps

2023 Alt 4 Build Conditions




PM Peak Hour




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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	0	277	84	346	0	0	414	71
Future Volume (veh/h)	0	0	0	0	0	277	84	346	0	0	414	71
Number				3	8	18	5	2	12	1	6	16
Initial Q (Ob), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				0	0	1792	1776	1776	0	0	1776	1776
Adj Flow Rate, veh/h				0	0	292	88	364	0	0	436	0
Adj No. of Lanes				0	0	1	1	2	0	0	2	1
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				0	0	6	7	7	0	0	7	7
Cap, veh/h				0	0	0	757	2627	0	0	1638	733
Arrive On Green				0.00	0.00	0.00	0.07	0.78	0.00	0.00	0.49	0.00
Sat Flow, veh/h					0		1691	3463	0	0	3463	1509
Grp Volume(v), veh/h					0.0		88	364	0	0	436	0
Grp Sat Flow(s),veh/h/ln							1691	1687	0	0	1687	1509
Q Serve(g_s), s							0.5	0.7	0.0	0.0	2.1	0.0
Cycle Q Clear(g_c), s							0.5	0.7	0.0	0.0	2.1	0.0
Prop In Lane							1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h							757	2627	0	0	1638	733
V/C Ratio(X)							0.12	0.14	0.00	0.00	0.27	0.00
Avail Cap(c_a), veh/h							1447	6352	0	0	3985	1783
HCM Platoon Ratio							1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)							1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh							2.3	0.7	0.0	0.0	4.1	0.0
Incr Delay (d2), s/veh							0.1	0.0	0.0	0.0	0.1	0.0
Initial Q Delay(d3),s/veh							0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln							0.2	0.3	0.0	0.0	0.9	0.0
LnGrp Delay(d),s/veh							2.4	0.8	0.0	0.0	4.2	0.0
LnGrp LOS							A	A			A	
Approach Vol, veh/h								452			436	
Approach Delay, s/veh								1.1			4.2	
Approach LOS								A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6						
Phs Duration (G+Y+Rc), s		27.1			7.9	19.2						
Change Period (Y+Rc), s		6.0			6.0	6.0						
Max Green Setting (Gmax), s		51.0			13.0	32.0						
Max Q Clear Time (g_c+I1), s		2.7			2.5	4.1						
Green Ext Time (p_c), s		9.1			0.1	9.1						
Intersection Summary												
HCM 2010 Ctrl Delay				2.6								
HCM 2010 LOS				A								

HCM 2010 TWSC
4: Jedburg Road & Drop Off Drive

2023 Alt 4 Build Conditions
PM Peak Hour

Intersection												
Int Delay, s/veh	4.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↰↱		↰	↰		↰	↰↱	↰	↰	↰↱	
Traffic Vol, veh/h	28	8	82	69	8	26	71	507	45	14	334	59
Future Vol, veh/h	28	8	82	69	8	26	71	507	45	14	334	59
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	175	-	-	200	-	200	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	8	8	8	8	8	8	7	7	7	7	7	7
Mvmt Flow	30	9	88	74	9	28	76	545	48	15	359	63
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	850	1166	211	911	1149	273	422	0	0	593	0	0
Stage 1	421	421	-	697	697	-	-	-	-	-	-	-
Stage 2	429	745	-	214	452	-	-	-	-	-	-	-
Critical Hdwy	7.66	6.66	7.06	7.66	6.66	7.06	4.24	-	-	4.24	-	-
Critical Hdwy Stg 1	6.66	5.66	-	6.66	5.66	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.66	5.66	-	6.66	5.66	-	-	-	-	-	-	-
Follow-up Hdwy	3.58	4.08	3.38	3.58	4.08	3.38	2.27	-	-	2.27	-	-
Pot Cap-1 Maneuver	244	184	776	220	188	707	1099	-	-	945	-	-
Stage 1	565	572	-	384	427	-	-	-	-	-	-	-
Stage 2	559	405	-	751	554	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	211	169	776	176	172	707	1099	-	-	945	-	-
Mov Cap-2 Maneuver	211	169	-	176	172	-	-	-	-	-	-	-
Stage 1	526	563	-	358	398	-	-	-	-	-	-	-
Stage 2	489	377	-	645	545	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	15.1		31.4		1		0.3					
HCM LOS	C		D									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBL	SBT	SBR	
Capacity (veh/h)	1099	-	-	211	169	665	176	408	945	-	-	
HCM Lane V/C Ratio	0.069	-	-	0.143	0.025	0.139	0.422	0.09	0.016	-	-	
HCM Control Delay (s)	8.5	-	-	24.9	26.9	11.3	39.6	14.7	8.9	-	-	
HCM Lane LOS	A	-	-	C	D	B	E	B	A	-	-	
HCM 95th %tile Q(veh)	0.2	-	-	0.5	0.1	0.5	1.9	0.3	0	-	-	

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	7	1	451	4	2	579
Future Vol, veh/h	7	1	451	4	2	579
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	7	7	7	7
Mvmt Flow	8	1	501	4	2	643
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	829	253	0	0	505	0
Stage 1	503	-	-	-	-	-
Stage 2	326	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.24	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.27	-
Pot Cap-1 Maneuver	309	746	-	-	1022	-
Stage 1	573	-	-	-	-	-
Stage 2	704	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	308	746	-	-	1022	-
Mov Cap-2 Maneuver	308	-	-	-	-	-
Stage 1	573	-	-	-	-	-
Stage 2	702	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	16.1	0		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	332	1022	-	
HCM Lane V/C Ratio	-	-	0.027	0.002	-	
HCM Control Delay (s)	-	-	16.1	8.5	0	
HCM Lane LOS	-	-	C	A	A	
HCM 95th %tile Q(veh)	-	-	0.1	0	-	

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	1	0	454	584	2
Future Vol, veh/h	1	1	0	454	584	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	50	50	7	7	7	7
Mvmt Flow	1	1	0	504	649	2
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	902	326	651	0	-	0
Stage 1	650	-	-	-	-	-
Stage 2	252	-	-	-	-	-
Critical Hdwy	7.8	7.9	4.24	-	-	-
Critical Hdwy Stg 1	6.8	-	-	-	-	-
Critical Hdwy Stg 2	6.8	-	-	-	-	-
Follow-up Hdwy	4	3.8	2.27	-	-	-
Pot Cap-1 Maneuver	202	548	898	-	-	-
Stage 1	370	-	-	-	-	-
Stage 2	641	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	202	548	898	-	-	-
Mov Cap-2 Maneuver	202	-	-	-	-	-
Stage 1	370	-	-	-	-	-
Stage 2	641	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	17.3	0		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	898	-	295	-	-	
HCM Lane V/C Ratio	-	-	0.008	-	-	
HCM Control Delay (s)	0	-	17.3	-	-	
HCM Lane LOS	A	-	C	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	

MOVEMENT SUMMARY

 Site: 2023_PM

I-26 WB & SC 27
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: SC 27											
3	L2	100	7.0	0.095	4.2	LOS A	0.0	0.0	0.00	0.00	33.4
8	T1	186	7.0	0.176	5.0	LOS A	0.0	0.0	0.00	0.00	41.8
Approach		286	7.0	0.176	4.7	LOS A	0.0	0.0	0.00	0.00	38.4
East: I-26 WB Off-Ramp											
1	L2	243	7.0	0.288	7.4	LOS A	0.8	21.9	0.34	0.29	28.9
6	T1	2	7.0	0.288	7.4	LOS A	0.8	21.9	0.34	0.29	25.9
16	R2	319	7.0	0.204	0.0	LOS A	0.0	0.0	0.00	0.00	29.3
Approach		564	7.0	0.288	3.2	LOS A	0.8	21.9	0.15	0.13	29.1
North: SC 27											
4	T1	580	7.0	0.397	10.1	LOS B	1.7	43.8	0.54	0.51	35.2
14	R2	70	7.0	0.045	0.0	LOS A	0.0	0.0	0.00	0.00	41.1
Approach		650	7.0	0.397	9.0	LOS A	1.7	43.8	0.48	0.46	35.7
All Vehicles		1500	7.0	0.397	6.0	LOS A	1.7	43.8	0.26	0.25	33.3

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

 Site: 2023_PM

I-26 EB & SC 27
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: SC 27											
8	T1	260	7.0	0.190	7.5	LOS A	0.7	17.3	0.49	0.45	36.7
18	R2	192	7.0	0.123	0.0	LOS A	0.0	0.0	0.00	0.00	36.4
Approach		452	7.0	0.190	4.3	LOS A	0.7	17.3	0.28	0.26	36.6
North: SC 27											
7	L2	381	7.0	0.361	7.1	LOS A	0.0	0.0	0.00	0.00	34.4
4	T1	442	7.0	0.419	7.9	LOS A	0.0	0.0	0.00	0.00	41.8
Approach		823	7.0	0.419	7.6	LOS A	0.0	0.0	0.00	0.00	38.0
West: I-26 EB Off-Ramp											
5	L2	26	8.0	0.047	6.9	LOS A	0.1	2.9	0.47	0.47	31.2
2	T1	1	8.0	0.047	6.9	LOS A	0.1	2.9	0.47	0.47	31.4
12	R2	124	8.0	0.080	0.0	LOS A	0.0	0.0	0.00	0.00	36.6
Approach		151	8.0	0.080	1.2	LOS A	0.1	2.9	0.08	0.08	35.5
All Vehicles		1427	7.1	0.419	5.9	LOS A	0.7	17.3	0.10	0.09	37.3

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.




Gap-Acceptance Capacity: Traditional M1.





HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Intersection						
Int Delay, s/veh	0.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	4	4	406	8	9	500
Future Vol, veh/h	4	4	406	8	9	500
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	7	7	7	7
Mvmt Flow	4	4	432	9	10	532
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	723	221	0	0	441	0
Stage 1	437	-	-	-	-	-
Stage 2	286	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.24	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.27	-
Pot Cap-1 Maneuver	361	783	-	-	1081	-
Stage 1	619	-	-	-	-	-
Stage 2	737	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	356	783	-	-	1081	-
Mov Cap-2 Maneuver	356	-	-	-	-	-
Stage 1	619	-	-	-	-	-
Stage 2	727	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	12.5	0		0.2		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	489	1081	-	
HCM Lane V/C Ratio	-	-	0.017	0.009	-	
HCM Control Delay (s)	-	-	12.5	8.4	0.1	
HCM Lane LOS	-	-	B	A	A	
HCM 95th %tile Q(veh)	-	-	0.1	0	-	

Intersection												
Int Delay, s/veh	4.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	2	23	106	9	18	21	132	30	18	149	13
Future Vol, veh/h	6	2	23	106	9	18	21	132	30	18	149	13
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	8	8	8	8	8	8	24	24	24	24	24	24
Mvmt Flow	7	2	25	116	10	20	23	145	33	20	164	14
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	434	435	171	433	426	162	178	0	0	178	0	0
Stage 1	211	211	-	208	208	-	-	-	-	-	-	-
Stage 2	223	224	-	225	218	-	-	-	-	-	-	-
Critical Hdwy	7.18	6.58	6.28	7.18	6.58	6.28	4.34	-	-	4.34	-	-
Critical Hdwy Stg 1	6.18	5.58	-	6.18	5.58	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.18	5.58	-	6.18	5.58	-	-	-	-	-	-	-
Follow-up Hdwy	3.572	4.072	3.372	3.572	4.072	3.372	2.416	-	-	2.416	-	-
Pot Cap-1 Maneuver	522	505	857	523	511	867	1276	-	-	1276	-	-
Stage 1	778	717	-	780	719	-	-	-	-	-	-	-
Stage 2	766	707	-	764	712	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	488	486	857	492	492	867	1276	-	-	1276	-	-
Mov Cap-2 Maneuver	488	486	-	492	492	-	-	-	-	-	-	-
Stage 1	762	705	-	764	705	-	-	-	-	-	-	-
Stage 2	723	693	-	727	700	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	10.3		14.5		0.9		0.8					
HCM LOS	B		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1276	-	-	717	523	1276	-	-				
HCM Lane V/C Ratio	0.018	-	-	0.048	0.279	0.016	-	-				
HCM Control Delay (s)	7.9	0	-	10.3	14.5	7.9	0	-				
HCM Lane LOS	A	A	-	B	B	A	A	-				
HCM 95th %tile Q(veh)	0.1	-	-	0.1	1.1	0	-	-				

Intersection												
Int Delay, s/veh	4.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔			↔			↔	
Traffic Vol, veh/h	0	0	0	80	0	86	28	97	0	0	249	29
Future Vol, veh/h	0	0	0	80	0	86	28	97	0	0	249	29
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	21	21	21	21	21	21	24	24	24	24	24	24
Mvmt Flow	0	0	0	89	0	96	31	108	0	0	277	32
Major/Minor				Minor1		Major1		Major2				
Conflicting Flow All				463	479	108	309	0	-	-	-	0
Stage 1				170	170	-	-	-	-	-	-	-
Stage 2				293	309	-	-	-	-	-	-	-
Critical Hdwy				6.61	6.71	6.41	4.34	-	-	-	-	-
Critical Hdwy Stg 1				5.61	5.71	-	-	-	-	-	-	-
Critical Hdwy Stg 2				5.61	5.71	-	-	-	-	-	-	-
Follow-up Hdwy				3.689	4.189	3.489	2.416	-	-	-	-	-
Pot Cap-1 Maneuver				524	459	897	1137	-	0	0	-	-
Stage 1				816	723	-	-	-	0	0	-	-
Stage 2				716	627	-	-	-	0	0	-	-
Platoon blocked, %								-			-	-
Mov Cap-1 Maneuver				509	0	897	1137	-	-	-	-	-
Mov Cap-2 Maneuver				509	0	-	-	-	-	-	-	-
Stage 1				792	0	-	-	-	-	-	-	-
Stage 2				716	0	-	-	-	-	-	-	-
Approach				WB		NB		SB				
HCM Control Delay, s				12.6		1.8		0				
HCM LOS				B								
Minor Lane/Major Mvmt				NBL	NBTWBLn1	SBT	SBR					
Capacity (veh/h)				1137	-	656	-					
HCM Lane V/C Ratio				0.027	-	0.281	-					
HCM Control Delay (s)				8.3	0	12.6	-					
HCM Lane LOS				A	A	B	-					
HCM 95th %tile Q(veh)				0.1	-	1.2	-					

Intersection												
Int Delay, s/veh	2.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Traffic Vol, veh/h	11	0	20	0	0	0	0	114	56	107	222	0
Future Vol, veh/h	11	0	20	0	0	0	0	114	56	107	222	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	52	52	52	52	52	52	24	24	24	24	24	24
Mvmt Flow	12	0	22	0	0	0	0	127	62	119	247	0




Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	643	674	247	-	0	0	189	0	0
Stage 1	485	485	-	-	-	-	-	-	-
Stage 2	158	189	-	-	-	-	-	-	-
Critical Hdwy	6.92	7.02	6.72	-	-	-	4.34	-	-
Critical Hdwy Stg 1	5.92	6.02	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.92	6.02	-	-	-	-	-	-	-
Follow-up Hdwy	3.968	4.468	3.768	-	-	-	2.416	-	-
Pot Cap-1 Maneuver	368	319	684	0	-	-	1263	-	0
Stage 1	528	477	-	0	-	-	-	-	0
Stage 2	762	659	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	328	0	684	-	-	-	1263	-	-
Mov Cap-2 Maneuver	328	0	-	-	-	-	-	-	-
Stage 1	528	0	-	-	-	-	-	-	-
Stage 2	679	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.8	0	2.6
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	SBL	SBT
Capacity (veh/h)	-	-	494	1263	-
HCM Lane V/C Ratio	-	-	0.07	0.094	-
HCM Control Delay (s)	-	-	12.8	8.1	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0.3	-

Intersection

Int Delay, s/veh 6.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	36	89	123	134	176	67
Future Vol, veh/h	36	89	123	134	176	67
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	6	6	24	24	24	24
Mvmt Flow	40	99	137	149	196	74

























Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	286	0	0 391 212
Stage 1	-	-	- 212 -
Stage 2	-	-	- 179 -
Critical Hdwy	4.16	-	- 6.64 6.44
Critical Hdwy Stg 1	-	-	- 5.64 -
Critical Hdwy Stg 2	-	-	- 5.64 -
Follow-up Hdwy	2.254	-	- 3.716 3.516
Pot Cap-1 Maneuver	1253	-	- 572 776
Stage 1	-	-	- 774 -
Stage 2	-	-	- 802 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1253	-	- 553 776
Mov Cap-2 Maneuver	-	-	- 553 -
Stage 1	-	-	- 748 -
Stage 2	-	-	- 802 -

Approach	EB	WB	SB
HCM Control Delay, s	2.3	0	15.8
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1253	-	-	-	601
HCM Lane V/C Ratio	0.032	-	-	-	0.449
HCM Control Delay (s)	8	0	-	-	15.8
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	2.3

HCM 2010 Signalized Intersection Summary
15: Volvo Car Drive & Welcome Center/Factory Entrance

2023 Alt 4 Build Conditions
PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	0	79	219	0	72	18	112	25	8	174	5
Future Volume (veh/h)	27	0	79	219	0	72	18	112	25	8	174	5
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727
Adj Flow Rate, veh/h	29	0	86	238	0	78	20	122	27	9	189	5
Adj No. of Lanes	1	1	1	1	1	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	10	10	10	10	10	10	10	10	10	10	10	10
Cap, veh/h	323	164	140	540	393	334	288	338	287	331	320	272
Arrive On Green	0.03	0.00	0.10	0.16	0.00	0.23	0.02	0.20	0.20	0.01	0.19	0.19
Sat Flow, veh/h	1645	1727	1468	1645	1727	1468	1645	1727	1468	1645	1727	1468
Grp Volume(v), veh/h	29	0	86	238	0	78	20	122	27	9	189	5
Grp Sat Flow(s),veh/h/ln	1645	1727	1468	1645	1727	1468	1645	1727	1468	1645	1727	1468
Q Serve(g_s), s	0.7	0.0	2.5	5.3	0.0	1.9	0.4	2.7	0.7	0.2	4.4	0.1
Cycle Q Clear(g_c), s	0.7	0.0	2.5	5.3	0.0	1.9	0.4	2.7	0.7	0.2	4.4	0.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	323	164	140	540	393	334	288	338	287	331	320	272
V/C Ratio(X)	0.09	0.00	0.62	0.44	0.00	0.23	0.07	0.36	0.09	0.03	0.59	0.02
Avail Cap(c_a), veh/h	612	622	529	648	661	562	589	622	529	649	622	529
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.4	0.0	19.3	12.9	0.0	14.0	14.4	15.5	14.6	14.5	16.6	14.8
Incr Delay (d2), s/veh	0.1	0.0	4.3	0.6	0.0	0.4	0.1	0.7	0.1	0.0	1.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	1.2	2.4	0.0	0.8	0.2	1.3	0.3	0.1	2.3	0.1
LnGrp Delay(d),s/veh	17.5	0.0	23.7	13.4	0.0	14.3	14.5	16.1	14.8	14.6	18.3	14.8
LnGrp LOS	B		C	B		B	B	B	B	B	B	B
Approach Vol, veh/h	115				316				169		203	
Approach Delay, s/veh	22.1				13.7				15.7		18.0	
Approach LOS	C				B				B		B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.9	14.2	7.2	16.1	6.4	14.7	13.1	10.2				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	9.0	16.0	9.0	17.0	9.0	16.0	10.0	16.0				
Max Q Clear Time (g_c+I1), s	2.4	6.4	2.7	3.9	2.2	4.7	7.3	4.5				
Green Ext Time (p_c), s	0.0	1.8	0.0	0.1	0.0	1.2	0.2	0.2				
Intersection Summary												
HCM 2010 Ctrl Delay	16.4											
HCM 2010 LOS	B											










June 2019

D.11 2043 BUILD – ALTERNATIVE 4



HCM 2010 TWSC
1: Jedburg Road & Old Dairy Road

2043 Alt 4 Build Conditions
AM Peak Hour

Intersection												
Int Delay, s/veh	137.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	109	4	47	11	8	113	39	930	25	160	625	120
Future Vol, veh/h	109	4	47	11	8	113	39	930	25	160	625	120
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Yield	-	-	None	-	-	None
Storage Length	0	-	250	150	-	150	150	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	34	34	34	34	34	34	11	11	11	11	11	11
Mvmt Flow	115	4	49	12	8	119	41	979	26	168	658	126

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1633	2144	392	1741	2194	503	784	0	0	1005	0	0
Stage 1	1057	1057	-	1074	1074	-	-	-	-	-	-	-
Stage 2	576	1087	-	667	1120	-	-	-	-	-	-	-
Critical Hdwy	8.18	7.18	7.58	8.18	7.18	7.58	4.32	-	-	4.32	-	-
Critical Hdwy Stg 1	7.18	6.18	-	7.18	6.18	-	-	-	-	-	-	-
Critical Hdwy Stg 2	7.18	6.18	-	7.18	6.18	-	-	-	-	-	-	-
Follow-up Hdwy	3.84	4.34	3.64	3.84	4.34	3.64	2.31	-	-	2.31	-	-
Pot Cap-1 Maneuver	~ 48	32	525	39	30	438	774	-	-	633	-	-
Stage 1	190	239	-	185	234	-	-	-	-	-	-	-
Stage 2	398	230	-	346	221	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 19	22	525	23	21	438	774	-	-	633	-	-
Mov Cap-2 Maneuver	~ 19	22	-	23	21	-	-	-	-	-	-	-
Stage 1	180	176	-	175	222	-	-	-	-	-	-	-
Stage 2	264	218	-	225	162	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, \$ 1828.9		52.3	0.4	2.3
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	774	-	-	19	188	23	21	438	633	-	-
HCM Lane V/C Ratio	0.053	-	-	6.039	0.286	0.503	0.401	0.272	0.266	-	-
HCM Control Delay (s)	9.9	-	-	\$ 2669.9	31.6	268.8	263.2	16.3	12.7	-	-
HCM Lane LOS	A	-	-	F	D	F	F	C	B	-	-
HCM 95th %tile Q(veh)	0.2	-	-	14.9	1.1	1.5	1.2	1.1	1.1	-	-



















Notes											
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined				*: All major volume in platoon			

HCM 2010 Signalized Intersection Summary

2: Jedburg Road & I-26 EB Ramps

2043 Alt 4 Build Conditions

AM Peak Hour


















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	28	0	157	0	0	0	0	403	749	356	748	0
Future Volume (veh/h)	28	0	157	0	0	0	0	403	749	356	748	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1473	1473				0	1712	1712	1712	1712	0
Adj Flow Rate, veh/h	29	0	165				0	424	788	375	787	0
Adj No. of Lanes	0	1	1				0	2	1	1	2	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	29	29	29				0	11	11	11	11	0
Cap, veh/h	216	0	193				0	1626	727	480	2287	0
Arrive On Green	0.15	0.00	0.15				0.00	0.50	0.50	0.13	0.70	0.00
Sat Flow, veh/h	1403	0	1252				0	3338	1455	1630	3338	0
Grp Volume(v), veh/h	29	0	165				0	424	788	375	787	0
Grp Sat Flow(s),veh/h/ln	1403	0	1252				0	1626	1455	1630	1626	0
Q Serve(g_s), s	1.5	0.0	10.8				0.0	6.3	42.0	8.6	8.0	0.0
Cycle Q Clear(g_c), s	1.5	0.0	10.8				0.0	6.3	42.0	8.6	8.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	216	0	193				0	1626	727	480	2287	0
V/C Ratio(X)	0.13	0.00	0.86				0.00	0.26	1.08	0.78	0.34	0.00
Avail Cap(c_a), veh/h	267	0	238				0	1626	727	537	2400	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	30.7	0.0	34.6				0.0	12.1	21.0	9.5	4.9	0.0
Incr Delay (d2), s/veh	0.3	0.0	21.6				0.0	0.1	58.2	6.6	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	4.9				0.0	2.8	28.5	5.5	3.5	0.0
LnGrp Delay(d),s/veh	31.0	0.0	56.2				0.0	12.2	79.2	16.1	5.0	0.0
LnGrp LOS	C		E					B	F	B	A	
Approach Vol, veh/h		194						1212			1162	
Approach Delay, s/veh		52.4						55.8			8.6	
Approach LOS		D						E			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	17.1	48.0		18.9		65.1						
Change Period (Y+Rc), s	6.0	6.0		6.0		6.0						
Max Green Setting (Gmax), s	14.0	42.0		16.0		62.0						
Max Q Clear Time (g_c+I1), s	10.6	44.0		12.8		10.0						
Green Ext Time (p_c), s	0.4	0.0		0.3		23.7						
Intersection Summary												
HCM 2010 Ctrl Delay			34.1									
HCM 2010 LOS			C									

HCM 2010 Signalized Intersection Summary

3: Jedburg Road & I-26 WB Ramps










2043 Alt 4 Build Conditions

AM Peak Hour

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	0	194	84	347	0	0	700	109
Future Volume (veh/h)	0	0	0	0	0	194	84	347	0	0	700	109
Number				3	8	18	5	2	12	1	6	16
Initial Q (Ob), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				0	0	1727	1712	1712	0	0	1712	1712
Adj Flow Rate, veh/h				0	0	204	88	365	0	0	737	0
Adj No. of Lanes				0	0	1	1	2	0	0	2	1
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				0	0	10	11	11	0	0	11	11
Cap, veh/h				0	0	0	631	2749	0	0	2040	913
Arrive On Green				0.00	0.00	0.00	0.06	0.85	0.00	0.00	0.63	0.00
Sat Flow, veh/h					0		1630	3338	0	0	3338	1455
Grp Volume(v), veh/h					0.0		88	365	0	0	737	0
Grp Sat Flow(s),veh/h/ln							1630	1626	0	0	1626	1455
Q Serve(g_s), s							0.6	0.8	0.0	0.0	4.2	0.0
Cycle Q Clear(g_c), s							0.6	0.8	0.0	0.0	4.2	0.0
Prop In Lane							1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h							631	2749	0	0	2040	913
V/C Ratio(X)							0.14	0.13	0.00	0.00	0.36	0.00
Avail Cap(c_a), veh/h							1074	5116	0	0	3522	1576
HCM Platoon Ratio							1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)							1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh							1.9	0.5	0.0	0.0	3.5	0.0
Incr Delay (d2), s/veh							0.1	0.0	0.0	0.0	0.1	0.0
Initial Q Delay(d3),s/veh							0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln							0.2	0.3	0.0	0.0	1.9	0.0
LnGrp Delay(d),s/veh							2.0	0.5	0.0	0.0	3.6	0.0
LnGrp LOS							A	A			A	
Approach Vol, veh/h								453			737	
Approach Delay, s/veh								0.8			3.6	
Approach LOS								A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6						
Phs Duration (G+Y+Rc), s		38.8			8.4	30.3						
Change Period (Y+Rc), s		6.0			6.0	6.0						
Max Green Setting (Gmax), s		61.0			13.0	42.0						
Max Q Clear Time (g_c+I1), s		2.8			2.6	6.2						
Green Ext Time (p_c), s		9.6			0.1	18.1						
Intersection Summary												
HCM 2010 Ctrl Delay			2.5									
HCM 2010 LOS			A									




HCM 2010 TWSC
4: Jedburg Road & Drop Off Drive

2043 Alt 4 Build Conditions
AM Peak Hour

Intersection												
Int Delay, s/veh	7.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	43	11	120	63	18	18	70	390	81	23	626	70
Future Vol, veh/h	43	11	120	63	18	18	70	390	81	23	626	70
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	175	-	-	200	-	200	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	22	22	22	22	22	22	11	11	11	11	11	11
Mvmt Flow	46	12	128	67	19	19	74	415	86	24	666	74
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1116	1400	370	950	1351	208	740	0	0	501	0	0
Stage 1	751	751	-	563	563	-	-	-	-	-	-	-
Stage 2	365	649	-	387	788	-	-	-	-	-	-	-
Critical Hdwy	7.94	6.94	7.34	7.94	6.94	7.34	4.32	-	-	4.32	-	-
Critical Hdwy Stg 1	6.94	5.94	-	6.94	5.94	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.94	5.94	-	6.94	5.94	-	-	-	-	-	-	-
Follow-up Hdwy	3.72	4.22	3.52	3.72	4.22	3.52	2.31	-	-	2.31	-	-
Pot Cap-1 Maneuver	139	117	573	187	126	740	806	-	-	999	-	-
Stage 1	327	372	-	431	460	-	-	-	-	-	-	-
Stage 2	575	418	-	557	356	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	108	104	573	122	112	740	806	-	-	999	-	-
Mov Cap-2 Maneuver	108	104	-	122	112	-	-	-	-	-	-	-
Stage 1	297	363	-	391	418	-	-	-	-	-	-	-
Stage 2	485	380	-	409	347	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	28.6		52		1.3		0.3					
HCM LOS	D		F									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR		
Capacity (veh/h)	806	-	-	108	416	122	195	999	-	-		
HCM Lane V/C Ratio	0.092	-	-	0.424	0.335	0.549	0.196	0.024	-	-		
HCM Control Delay (s)	9.9	-	-	60.9	18	65.7	27.9	8.7	-	-		
HCM Lane LOS	A	-	-	F	C	F	D	A	-	-		
HCM 95th %tile Q(veh)	0.3	-	-	1.8	1.4	2.6	0.7	0.1	-	-		

Intersection




Int Delay, s/veh 0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	3	0	549	1	0	500
Future Vol, veh/h	3	0	549	1	0	500
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	16	16	16	16
Mvmt Flow	3	0	610	1	0	556

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	889	306	0
Stage 1	611	-	-
Stage 2	278	-	-
Critical Hdwy	6.84	6.94	-
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	5.84	-	-
Follow-up Hdwy	3.52	3.32	-
Pot Cap-1 Maneuver	283	690	-
Stage 1	504	-	-
Stage 2	744	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	283	690	-
Mov Cap-2 Maneuver	283	-	-
Stage 1	504	-	-
Stage 2	744	-	-

Approach	WB	NB	SB
HCM Control Delay, s	17.9	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	283	874
HCM Lane V/C Ratio	-	-	0.012	-
HCM Control Delay (s)	-	-	17.9	0
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0	0

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	1	0	549	499	4
Future Vol, veh/h	1	1	0	549	499	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	50	50	16	16	16	16
Mvmt Flow	1	1	0	603	548	4
Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	852	276	552	0	-	0
Stage 1	550	-	-	-	-	-
Stage 2	302	-	-	-	-	-
Critical Hdwy	7.8	7.9	4.42	-	-	-
Critical Hdwy Stg 1	6.8	-	-	-	-	-
Critical Hdwy Stg 2	6.8	-	-	-	-	-
Follow-up Hdwy	4	3.8	2.36	-	-	-
Pot Cap-1 Maneuver	220	596	923	-	-	-
Stage 1	426	-	-	-	-	-
Stage 2	599	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	220	596	923	-	-	-
Mov Cap-2 Maneuver	220	-	-	-	-	-
Stage 1	426	-	-	-	-	-
Stage 2	599	-	-	-	-	-
Approach	EB		NB		SB	
HCM Control Delay, s	16.3		0		0	
HCM LOS	C					
Minor Lane/Major Mvmt	NBL		NBT	EBLn1	SBT	SBR
Capacity (veh/h)	923		-	321	-	-
HCM Lane V/C Ratio	-		-	0.007	-	-
HCM Control Delay (s)	0		-	16.3	-	-
HCM Lane LOS	A		-	C	-	-
HCM 95th %tile Q(veh)	0		-	0	-	-

MOVEMENT SUMMARY

 Site: 2043_AM

I-26 WB & SC 27
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: SC 27											
3	L2	147	22.0	0.159	5.4	LOS A	0.0	0.0	0.00	0.00	33.3
8	T1	300	22.0	0.324	7.4	LOS A	0.0	0.0	0.00	0.00	39.2
Approach		447	22.0	0.324	6.7	LOS A	0.0	0.0	0.00	0.00	37.0
East: I-26 WB Off-Ramp											
1	L2	260	27.0	0.430	12.5	LOS B	1.2	35.4	0.47	0.50	25.5
6	T1	2	0.0	0.430	12.5	LOS B	1.2	35.4	0.47	0.50	24.5
16	R2	284	27.0	0.215	0.0	LOS A	0.0	0.0	0.00	0.00	29.2
Approach		546	26.9	0.430	6.0	LOS A	1.2	35.4	0.23	0.24	27.3
North: SC 27											
4	T1	504	22.0	0.454	14.0	LOS B	1.7	50.5	0.60	0.63	31.5
14	R2	28	22.0	0.020	0.0	LOS A	0.0	0.0	0.00	0.00	38.4
Approach		532	22.0	0.454	13.3	LOS B	1.7	50.5	0.57	0.60	31.8
All Vehicles		1525	23.7	0.454	8.8	LOS A	1.7	50.5	0.28	0.29	31.2

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 **Site: 2043_AM**

I-26 EB & SC 27
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: SC 27											
8	T1	410	22.0	0.368	12.0	LOS B	1.2	36.3	0.57	0.58	32.4
18	R2	393	22.0	0.287	0.0	LOS A	0.0	0.0	0.00	0.00	35.9
Approach		803	22.0	0.368	6.2	LOS A	1.2	36.3	0.29	0.29	34.0
North: SC 27											
7	L2	362	22.0	0.390	8.3	LOS A	0.0	0.0	0.00	0.00	33.9
4	T1	427	22.0	0.462	9.5	LOS A	0.0	0.0	0.00	0.00	39.2
Approach		789	22.0	0.462	8.9	LOS A	0.0	0.0	0.00	0.00	36.5
West: I-26 EB Off-Ramp											
5	L2	52	29.0	0.118	9.7	LOS A	0.2	7.2	0.51	0.51	29.5
2	T1	1	29.0	0.118	9.7	LOS A	0.2	7.2	0.51	0.51	29.8
12	R2	134	29.0	0.103	0.0	LOS A	0.0	0.0	0.00	0.00	36.0
Approach		187	29.0	0.118	2.8	LOS A	0.2	7.2	0.15	0.15	33.8
All Vehicles		1779	22.7	0.462	7.0	LOS A	1.2	36.3	0.15	0.15	35.1

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.




Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	7	724	1	1	509
Future Vol, veh/h	2	7	724	1	1	509
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	21	21	21	21
Mvmt Flow	2	8	796	1	1	559
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	1079	399	0	0	797	0
Stage 1	797	-	-	-	-	-
Stage 2	282	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.52	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.41	-
Pot Cap-1 Maneuver	213	601	-	-	709	-
Stage 1	404	-	-	-	-	-
Stage 2	741	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	213	601	-	-	709	-
Mov Cap-2 Maneuver	213	-	-	-	-	-
Stage 1	404	-	-	-	-	-
Stage 2	740	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	13.6	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	- 428		709	-	
HCM Lane V/C Ratio	-	- 0.023		0.002	-	
HCM Control Delay (s)	-	- 13.6		10.1	0	
HCM Lane LOS	-	- B		B	A	
HCM 95th %tile Q(veh)	-	- 0.1		0	-	




Intersection												
Int Delay, s/veh	3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	8	8	31	39	4	19	10	207	46	16	134	1
Future Vol, veh/h	8	8	31	39	4	19	10	207	46	16	134	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	23	23	23	23	23	23	36	36	36	36	36	36
Mvmt Flow	9	9	34	43	4	21	11	230	51	18	149	1
Major/Minor	Minor2		Minor1		Major1				Major2			
Conflicting Flow All	476	489	150	485	464	256	150	0	0	281	0	0
Stage 1	186	186	-	278	278	-	-	-	-	-	-	-
Stage 2	290	303	-	207	186	-	-	-	-	-	-	-
Critical Hdwy	7.33	6.73	6.43	7.33	6.73	6.43	4.46	-	-	4.46	-	-
Critical Hdwy Stg 1	6.33	5.73	-	6.33	5.73	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.33	5.73	-	6.33	5.73	-	-	-	-	-	-	-
Follow-up Hdwy	3.707	4.207	3.507	3.707	4.207	3.507	2.524	-	-	2.524	-	-
Pot Cap-1 Maneuver	466	450	844	460	466	734	1248	-	-	1109	-	-
Stage 1	769	708	-	685	644	-	-	-	-	-	-	-
Stage 2	675	627	-	749	708	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	439	437	844	425	452	734	1248	-	-	1109	-	-
Mov Cap-2 Maneuver	439	437	-	425	452	-	-	-	-	-	-	-
Stage 1	761	695	-	677	637	-	-	-	-	-	-	-
Stage 2	644	620	-	696	695	-	-	-	-	-	-	-
Approach	EB		WB		NB				SB			
HCM Control Delay, s	11.1		13.5		0.3				0.9			
HCM LOS	B		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1248	-	-	642	490	1109	-	-				
HCM Lane V/C Ratio	0.009	-	-	0.081	0.141	0.016	-	-				
HCM Control Delay (s)	7.9	0	-	11.1	13.5	8.3	0	-				
HCM Lane LOS	A	A	-	B	B	A	A	-				
HCM 95th %tile Q(veh)	0	-	-	0.3	0.5	0	-	-				

Intersection												
Int Delay, s/veh	4.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔			↔			↔	
Traffic Vol, veh/h	0	0	0	71	3	118	33	145	0	0	174	30
Future Vol, veh/h	0	0	0	71	3	118	33	145	0	0	174	30
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	46	46	46	46	46	46	36	36	36	36	36	36
Mvmt Flow	0	0	0	76	3	126	35	154	0	0	185	32
Major/Minor												
Minor1				Major1				Major2				
Conflicting Flow All	425	441	154	217	0	-	-	-	-	-	0	
Stage 1	224	224	-	-	-	-	-	-	-	-	-	
Stage 2	201	217	-	-	-	-	-	-	-	-	-	
Critical Hdwy	6.86	6.96	6.66	4.46	-	-	-	-	-	-	-	
Critical Hdwy Stg 1	5.86	5.96	-	-	-	-	-	-	-	-	-	
Critical Hdwy Stg 2	5.86	5.96	-	-	-	-	-	-	-	-	-	
Follow-up Hdwy	3.914	4.414	3.714	2.524	-	-	-	-	-	-	-	
Pot Cap-1 Maneuver	511	450	788	1175	-	0	0	-	-	-	-	
Stage 1	720	644	-	-	-	0	0	-	-	-	-	
Stage 2	738	649	-	-	-	0	0	-	-	-	-	
Platoon blocked, %					-							
Mov Cap-1 Maneuver	494	0	788	1175	-	-	-	-	-	-	-	
Mov Cap-2 Maneuver	494	0	-	-	-	-	-	-	-	-	-	
Stage 1	696	0	-	-	-	-	-	-	-	-	-	
Stage 2	738	0	-	-	-	-	-	-	-	-	-	
Approach												
WB				NB				SB				
HCM Control Delay, s	13.2			1.5				0				
HCM LOS	B											
Minor Lane/Major Mvmt												
NBL				NBTWBLn1				SBT SBR				
Capacity (veh/h)	1175	-	644	-	-							
HCM Lane V/C Ratio	0.03	-	0.317	-	-							
HCM Control Delay (s)	8.2	0	13.2	-	-							
HCM Lane LOS	A	A	B	-	-							
HCM 95th %tile Q(veh)	0.1	-	1.4	-	-							

Intersection												
Int Delay, s/veh	3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↔						↔↕			↕↔	
Traffic Vol, veh/h	34	3	30	0	0	0	0	144	83	85	160	0
Future Vol, veh/h	34	3	30	0	0	0	0	144	83	85	160	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	53	53	53	53	53	53	36	36	36	36	36	36
Mvmt Flow	38	3	33	0	0	0	0	160	92	94	178	0
Major/Minor	Minor2						Major1			Major2		
Conflicting Flow All	572	618	178				-	0	0	252	0	0
Stage 1	366	366	-				-	-	-	-	-	-
Stage 2	206	252	-				-	-	-	-	-	-
Critical Hdwy	6.93	7.03	6.73				-	-	-	4.46	-	-
Critical Hdwy Stg 1	5.93	6.03	-				-	-	-	-	-	-
Critical Hdwy Stg 2	5.93	6.03	-				-	-	-	-	-	-
Follow-up Hdwy	3.977	4.477	3.777				-	-	-	2.524	-	-
Pot Cap-1 Maneuver	406	345	749				0	-	-	1139	-	0
Stage 1	602	542	-				0	-	-	-	-	0
Stage 2	721	614	-				0	-	-	-	-	0
Platoon blocked, %								-	-		-	
Mov Cap-1 Maneuver	369	0	749				-	-	-	1139	-	-
Mov Cap-2 Maneuver	369	0	-				-	-	-	-	-	-
Stage 1	602	0	-				-	-	-	-	-	-
Stage 2	655	0	-				-	-	-	-	-	-
Approach	EB						NB			SB		
HCM Control Delay, s	13.8						0			2.9		
HCM LOS	B											
Minor Lane/Major Mvmt		NBT	NBR	EBLn1	SBL	SBT						
Capacity (veh/h)		-	-	484	1139	-						
HCM Lane V/C Ratio		-	-	0.154	0.083	-						
HCM Control Delay (s)		-	-	13.8	8.4	0						
HCM Lane LOS		-	-	B	A	A						
HCM 95th %tile Q(veh)		-	-	0.5	0.3	-						

Intersection

Int Delay, s/veh 6.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	81	100	66	146	134	56
Future Vol, veh/h	81	100	66	146	134	56
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	19	19	36	36	36	36
Mvmt Flow	89	110	73	160	147	62

























Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	233	0	0 441 153
Stage 1	-	-	- 153 -
Stage 2	-	-	- 288 -
Critical Hdwy	4.29	-	- 6.76 6.56
Critical Hdwy Stg 1	-	-	- 5.76 -
Critical Hdwy Stg 2	-	-	- 5.76 -
Follow-up Hdwy	2.371	-	- 3.824 3.624
Pot Cap-1 Maneuver	1241	-	- 515 811
Stage 1	-	-	- 799 -
Stage 2	-	-	- 689 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1241	-	- 476 811
Mov Cap-2 Maneuver	-	-	- 476 -
Stage 1	-	-	- 738 -
Stage 2	-	-	- 689 -

Approach	EB	WB	SB
HCM Control Delay, s	3.6	0	15.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1241	-	-	-	542
HCM Lane V/C Ratio	0.072	-	-	-	0.385
HCM Control Delay (s)	8.1	0	-	-	15.7
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	1.8










HCM 2010 Signalized Intersection Summary
15: Volvo Car Drive & Welcome Center/Factory Entrance

2043 Alt 4 Build Conditions
AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	0	13	161	0	54	97	801	30	11	451	32
Future Volume (veh/h)	4	0	13	161	0	54	97	801	30	11	451	32
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727
Adj Flow Rate, veh/h	4	0	14	175	0	59	105	871	33	12	490	35
Adj No. of Lanes	1	1	1	1	1	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	10	10	10	10	10	10	10	10	10	10	10	10
Cap, veh/h	138	67	57	302	238	202	446	987	839	179	924	785
Arrive On Green	0.00	0.00	0.04	0.10	0.00	0.14	0.05	0.57	0.57	0.01	0.53	0.53
Sat Flow, veh/h	1645	1727	1468	1645	1727	1468	1645	1727	1468	1645	1727	1468
Grp Volume(v), veh/h	4	0	14	175	0	59	105	871	33	12	490	35
Grp Sat Flow(s),veh/h/ln	1645	1727	1468	1645	1727	1468	1645	1727	1468	1645	1727	1468
Q Serve(g_s), s	0.2	0.0	0.8	8.7	0.0	3.1	2.5	38.0	0.9	0.3	16.1	1.0
Cycle Q Clear(g_c), s	0.2	0.0	0.8	8.7	0.0	3.1	2.5	38.0	0.9	0.3	16.1	1.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	138	67	57	302	238	202	446	987	839	179	924	785
V/C Ratio(X)	0.03	0.00	0.25	0.58	0.00	0.29	0.24	0.88	0.04	0.07	0.53	0.04
Avail Cap(c_a), veh/h	300	317	269	302	317	269	536	1030	875	329	1030	875
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.0	0.0	40.7	34.1	0.0	33.8	9.8	16.2	8.2	16.2	13.2	9.7
Incr Delay (d2), s/veh	0.1	0.0	2.2	2.7	0.0	0.8	0.3	8.9	0.0	0.2	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.4	4.1	0.0	1.3	1.1	20.3	0.3	0.1	7.7	0.4
LnGrp Delay(d),s/veh	40.1	0.0	42.9	36.8	0.0	34.6	10.1	25.1	8.2	16.3	13.7	9.7
LnGrp LOS	D		D	D		C	B	C	A	B	B	A
Approach Vol, veh/h	18		234				1009				537	
Approach Delay, s/veh	42.3		36.2				23.0				13.5	
Approach LOS	D		D				C				B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.2	52.6	6.4	18.0	7.0	55.8	15.0	9.4				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	9.0	52.0	9.0	16.0	9.0	52.0	9.0	16.0				
Max Q Clear Time (g_c+I1), s	4.5	18.1	2.2	5.1	2.3	40.0	10.7	2.8				
Green Ext Time (p_c), s	0.1	11.8	0.0	0.1	0.0	9.8	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay	22.0											
HCM 2010 LOS	C											

HCM 2010 TWSC
1: Jedburg Road & Old Dairy Road

2043 Alt 4 Build Conditions
PM Peak Hour

Intersection												
Int Delay, s/veh	432.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	88	10	72	14	14	205	37	810	30	132	983	147
Future Vol, veh/h	88	10	72	14	14	205	37	810	30	132	983	147
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Yield	-	-	None	-	-	None
Storage Length	0	-	250	150	-	150	175	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	9	9	9	9	9	9	7	7	7	7	7	7
Mvmt Flow	97	11	79	15	15	225	41	890	33	145	1080	162

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1986	2456	621	1825	2521	462	1242	0	0	923	0	0
Stage 1	1451	1451	-	989	989	-	-	-	-	-	-	-
Stage 2	535	1005	-	836	1532	-	-	-	-	-	-	-
Critical Hdwy	7.68	6.68	7.08	7.68	6.68	7.08	4.24	-	-	4.24	-	-
Critical Hdwy Stg 1	6.68	5.68	-	6.68	5.68	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.68	5.68	-	6.68	5.68	-	-	-	-	-	-	-
Follow-up Hdwy	3.59	4.09	3.39	3.59	4.09	3.39	2.27	-	-	2.27	-	-
Pot Cap-1 Maneuver	~ 33	27	414	44	25	528	530	-	-	705	-	-
Stage 1	128	182	-	252	308	-	-	-	-	-	-	-
Stage 2	479	302	-	313	166	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	~ 4	20	414	16	18	528	530	-	-	705	-	-
Mov Cap-2 Maneuver	~ 4	20	-	16	18	-	-	-	-	-	-	-
Stage 1	118	145	-	233	284	-	-	-	-	-	-	-
Stage 2	240	279	-	186	132	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, \$ 6359.6		74	0.5	1.2
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	530	-	-	4	122	16	18	528	705	-	-
HCM Lane V/C Ratio	0.077	-	-	24.176	0.739	0.962	0.855	0.427	0.206	-	-
HCM Control Delay (s)	12.4	-	-	\$ 12200.9	90.9\$	533.5\$	451.6	16.8	11.4	-	-
HCM Lane LOS	B	-	-	F	F	F	F	C	B	-	-
HCM 95th %tile Q(veh)	0.2	-	-	14.2	4.2	2.4	2.2	2.1	0.8	-	-

Notes											
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon					

HCM 2010 Signalized Intersection Summary

2: Jedburg Road & I-26 EB Ramps

2043 Alt 4 Build Conditions

PM Peak Hour


















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	74	3	125	0	0	0	0	476	627	194	1137	0
Future Volume (veh/h)	74	3	125	0	0	0	0	476	627	194	1137	0
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1597	1597				0	1776	1776	1776	1776	0
Adj Flow Rate, veh/h	78	3	132				0	501	660	204	1197	0
Adj No. of Lanes	0	1	1				0	2	1	1	2	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	19	19	19				0	7	7	7	7	0
Cap, veh/h	195	7	180				0	1813	811	443	2360	0
Arrive On Green	0.13	0.13	0.13				0.00	0.54	0.54	0.08	0.70	0.00
Sat Flow, veh/h	1467	56	1357				0	3463	1509	1691	3463	0
Grp Volume(v), veh/h	81	0	132				0	501	660	204	1197	0
Grp Sat Flow(s),veh/h/ln	1523	0	1357				0	1687	1509	1691	1687	0
Q Serve(g_s), s	3.5	0.0	6.7				0.0	5.8	25.7	3.5	11.8	0.0
Cycle Q Clear(g_c), s	3.5	0.0	6.7				0.0	5.8	25.7	3.5	11.8	0.0
Prop In Lane	0.96		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	202	0	180				0	1813	811	443	2360	0
V/C Ratio(X)	0.40	0.00	0.73				0.00	0.28	0.81	0.46	0.51	0.00
Avail Cap(c_a), veh/h	341	0	304				0	2218	992	523	2925	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	0.00	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	28.4	0.0	29.8				0.0	9.0	13.6	5.9	5.0	0.0
Incr Delay (d2), s/veh	1.3	0.0	5.7				0.0	0.1	4.4	0.7	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	2.8				0.0	2.7	11.6	1.7	5.4	0.0
LnGrp Delay(d),s/veh	29.7	0.0	35.5				0.0	9.1	18.0	6.7	5.2	0.0
LnGrp LOS	C		D					A	B	A	A	
Approach Vol, veh/h		213						1161			1401	
Approach Delay, s/veh		33.3						14.1			5.4	
Approach LOS		C						B			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	11.6	44.4		15.5		56.0						
Change Period (Y+Rc), s	6.0	6.0		6.0		6.0						
Max Green Setting (Gmax), s	9.0	47.0		16.0		62.0						
Max Q Clear Time (g_c+I1), s	5.5	27.7		8.7		13.8						
Green Ext Time (p_c), s	0.2	10.7		0.9		35.7						
Intersection Summary												
HCM 2010 Ctrl Delay			11.2									
HCM 2010 LOS			B									

HCM 2010 Signalized Intersection Summary

3: Jedburg Road & I-26 WB Ramps











2043 Alt 4 Build Conditions




PM Peak Hour

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	0	355	107	443	0	0	529	91
Future Volume (veh/h)	0	0	0	0	0	355	107	443	0	0	529	91
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				0	0	1792	1776	1776	0	0	1776	1776
Adj Flow Rate, veh/h				0	0	374	113	466	0	0	557	0
Adj No. of Lanes				0	0	1	1	2	0	0	2	1
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				0	0	6	7	7	0	0	7	7
Cap, veh/h				0	0	0	724	2719	0	0	1793	802
Arrive On Green				0.00	0.00	0.00	0.08	0.81	0.00	0.00	0.53	0.00
Sat Flow, veh/h					0		1691	3463	0	0	3463	1509
Grp Volume(v), veh/h					0.0		113	466	0	0	557	0
Grp Sat Flow(s),veh/h/ln							1691	1687	0	0	1687	1509
Q Serve(g_s), s							0.7	1.0	0.0	0.0	2.9	0.0
Cycle Q Clear(g_c), s							0.7	1.0	0.0	0.0	2.9	0.0
Prop In Lane							1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h							724	2719	0	0	1793	802
V/C Ratio(X)							0.16	0.17	0.00	0.00	0.31	0.00
Avail Cap(c_a), veh/h							1190	5349	0	0	3493	1563
HCM Platoon Ratio							1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)							1.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh							2.2	0.7	0.0	0.0	4.1	0.0
Incr Delay (d2), s/veh							0.1	0.0	0.0	0.0	0.1	0.0
Initial Q Delay(d3),s/veh							0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln							0.3	0.4	0.0	0.0	1.3	0.0
LnGrp Delay(d),s/veh							2.3	0.7	0.0	0.0	4.2	0.0
LnGrp LOS							A	A			A	
Approach Vol, veh/h								579			557	
Approach Delay, s/veh								1.0			4.2	
Approach LOS								A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6						
Phs Duration (G+Y+Rc), s		30.9			8.5	22.4						
Change Period (Y+Rc), s		6.0			6.0	6.0						
Max Green Setting (Gmax), s		49.0			11.0	32.0						
Max Q Clear Time (g_c+I1), s		3.0			2.7	4.9						
Green Ext Time (p_c), s		12.0			0.2	11.6						
Intersection Summary												
HCM 2010 Ctrl Delay			2.6									
HCM 2010 LOS			A									

HCM 2010 TWSC
4: Jedburg Road & Drop Off Drive




2043 Alt 4 Build Conditions
PM Peak Hour

Intersection												
Int Delay, s/veh	11.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	36	10	105	88	10	33	91	649	58	18	427	76
Future Vol, veh/h	36	10	105	88	10	33	91	649	58	18	427	76
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	175	-	-	200	-	200	175	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	8	8	8	8	8	8	7	7	7	7	7	7
Mvmt Flow	39	11	113	95	11	35	98	698	62	19	459	82
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1089	1494	271	1167	1473	349	541	0	0	760	0	0
Stage 1	538	538	-	894	894	-	-	-	-	-	-	-
Stage 2	551	956	-	273	579	-	-	-	-	-	-	-
Critical Hdwy	7.66	6.66	7.06	7.66	6.66	7.06	4.24	-	-	4.24	-	-
Critical Hdwy Stg 1	6.66	5.66	-	6.66	5.66	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.66	5.66	-	6.66	5.66	-	-	-	-	-	-	-
Follow-up Hdwy	3.58	4.08	3.38	3.58	4.08	3.38	2.27	-	-	2.27	-	-
Pot Cap-1 Maneuver	162	115	709	142	119	630	990	-	-	816	-	-
Stage 1	480	506	-	290	344	-	-	-	-	-	-	-
Stage 2	471	321	-	693	484	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	128	101	709	100	105	630	990	-	-	816	-	-
Mov Cap-2 Maneuver	128	101	-	100	105	-	-	-	-	-	-	-
Stage 1	432	494	-	261	310	-	-	-	-	-	-	-
Stage 2	387	289	-	557	473	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	22.5		109.4		1		0.3					
HCM LOS	C		F									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR		
Capacity (veh/h)	990	-	-	128	465	100	291	816	-	-		
HCM Lane V/C Ratio	0.099	-	-	0.302	0.266	0.946	0.159	0.024	-	-		
HCM Control Delay (s)	9	-	-	44.9	15.5	153.3	19.7	9.5	-	-		
HCM Lane LOS	A	-	-	E	C	F	C	A	-	-		
HCM 95th %tile Q(veh)	0.3	-	-	1.2	1.1	5.6	0.6	0.1	-	-		

Intersection						
Int Delay, s/veh	0.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	9	1	596	6	3	766
Future Vol, veh/h	9	1	596	6	3	766
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	7	7	7	7
Mvmt Flow	10	1	662	7	3	851
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	1098	335	0	0	669	0
Stage 1	666	-	-	-	-	-
Stage 2	432	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.24	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.27	-
Pot Cap-1 Maneuver	207	661	-	-	884	-
Stage 1	472	-	-	-	-	-
Stage 2	622	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	206	661	-	-	884	-
Mov Cap-2 Maneuver	206	-	-	-	-	-
Stage 1	469	-	-	-	-	-
Stage 2	622	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	22.2	0		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	221	884	-	
HCM Lane V/C Ratio	-	-	0.05	0.004	-	
HCM Control Delay (s)	-	-	22.2	9.1	0	
HCM Lane LOS	-	-	C	A	A	
HCM 95th %tile Q(veh)	-	-	0.2	0	-	

Intersection

Int Delay, s/veh 0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	1	0	601	772	3
Future Vol, veh/h	1	1	0	601	772	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	50	50	7	7	7	7
Mvmt Flow	1	1	0	668	858	3

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1194	431	861
Stage 1	860	-	-
Stage 2	334	-	-
Critical Hdwy	7.8	7.9	4.24
Critical Hdwy Stg 1	6.8	-	-
Critical Hdwy Stg 2	6.8	-	-
Follow-up Hdwy	4	3.8	2.27
Pot Cap-1 Maneuver	122	458	745
Stage 1	275	-	-
Stage 2	573	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	122	458	745
Mov Cap-2 Maneuver	122	-	-
Stage 1	275	-	-
Stage 2	573	-	-

Approach	EB	NB	SB
HCM Control Delay, s	23.9	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	745	-	193	-	-
HCM Lane V/C Ratio	-	-	0.012	-	-
HCM Control Delay (s)	0	-	23.9	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

MOVEMENT SUMMARY

 Site: 2043_PM

I-26 WB & SC 27
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: SC 27											
3	L2	147	11.0	0.144	4.9	LOS A	0.0	0.0	0.00	0.00	33.4
8	T1	246	11.0	0.241	5.9	LOS A	0.0	0.0	0.00	0.00	41.0
Approach		392	11.0	0.241	5.5	LOS A	0.0	0.0	0.00	0.00	37.8
East: I-26 WB Off-Ramp											
1	L2	340	10.0	0.453	10.9	LOS B	1.5	41.8	0.46	0.48	27.4
6	T1	3	10.0	0.453	10.9	LOS B	1.5	41.8	0.46	0.48	24.9
16	R2	422	10.0	0.277	0.0	LOS A	0.0	0.0	0.00	0.00	29.3
Approach		766	10.0	0.453	4.9	LOS A	1.5	41.8	0.21	0.22	28.4
North: SC 27											
4	T1	767	11.0	0.646	19.7	LOS C	3.7	100.6	0.72	0.80	30.2
14	R2	92	11.0	0.061	0.0	LOS A	0.0	0.0	0.00	0.00	40.3
Approach		859	11.0	0.646	17.6	LOS C	3.7	100.6	0.64	0.72	31.1
All Vehicles		2017	10.6	0.646	10.4	LOS B	3.7	100.6	0.35	0.39	31.0

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

 Site: 2043_PM

I-26 EB & SC 27
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: SC 27											
8	T1	359	11.0	0.321	11.0	LOS B	1.1	30.4	0.59	0.60	34.2
18	R2	278	11.0	0.184	0.0	LOS A	0.0	0.0	0.00	0.00	36.3
Approach		637	11.0	0.321	6.2	LOS A	1.1	30.4	0.33	0.34	35.1
North: SC 27											
7	L2	503	11.0	0.494	9.4	LOS A	0.0	0.0	0.00	0.00	34.3
4	T1	603	11.0	0.593	11.5	LOS B	0.0	0.0	0.00	0.00	41.0
Approach		1107	11.0	0.593	10.6	LOS B	0.0	0.0	0.00	0.00	37.6
West: I-26 EB Off-Ramp											
5	L2	33	14.0	0.082	9.8	LOS A	0.2	5.0	0.59	0.59	29.9
2	T1	1	14.0	0.082	9.8	LOS A	0.2	5.0	0.59	0.59	30.1
12	R2	179	14.0	0.122	0.0	LOS A	0.0	0.0	0.00	0.00	36.4
Approach		213	14.0	0.122	1.6	LOS A	0.2	5.0	0.10	0.10	35.1
All Vehicles		1957	11.3	0.593	8.2	LOS A	1.1	30.4	0.12	0.12	36.5

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).




Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: US HCM 2010.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Intersection						
Int Delay, s/veh	0.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	6	6	567	10	12	691
Future Vol, veh/h	6	6	567	10	12	691
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	11	11	11	11
Mvmt Flow	6	6	603	11	13	735
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	1003	307	0	0	614	0
Stage 1	609	-	-	-	-	-
Stage 2	394	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.32	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.31	-
Pot Cap-1 Maneuver	239	689	-	-	903	-
Stage 1	505	-	-	-	-	-
Stage 2	650	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	233	689	-	-	903	-
Mov Cap-2 Maneuver	233	-	-	-	-	-
Stage 1	493	-	-	-	-	-
Stage 2	650	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	15.7	0		0.3		
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	348	903	-	
HCM Lane V/C Ratio	-	-	0.037	0.014	-	
HCM Control Delay (s)	-	-	15.7	9	0.1	
HCM Lane LOS	-	-	C	A	A	
HCM 95th %tile Q(veh)	-	-	0.1	0	-	

Intersection												
Int Delay, s/veh	5.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	8	3	28	126	11	21	25	157	36	21	178	15
Future Vol, veh/h	8	3	28	126	11	21	25	157	36	21	178	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	8	8	8	8	8	8	24	24	24	24	24	24
Mvmt Flow	9	3	31	138	12	23	27	173	40	23	196	16
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	515	517	204	514	505	193	212	0	0	213	0	0
Stage 1	250	250	-	247	247	-	-	-	-	-	-	-
Stage 2	265	267	-	267	258	-	-	-	-	-	-	-
Critical Hdwy	7.18	6.58	6.28	7.18	6.58	6.28	4.34	-	-	4.34	-	-
Critical Hdwy Stg 1	6.18	5.58	-	6.18	5.58	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.18	5.58	-	6.18	5.58	-	-	-	-	-	-	-
Follow-up Hdwy	3.572	4.072	3.372	3.572	4.072	3.372	2.416	-	-	2.416	-	-
Pot Cap-1 Maneuver	461	454	822	462	461	833	1238	-	-	1237	-	-
Stage 1	741	689	-	744	691	-	-	-	-	-	-	-
Stage 2	727	677	-	725	683	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	424	434	822	427	440	833	1238	-	-	1237	-	-
Mov Cap-2 Maneuver	424	434	-	427	440	-	-	-	-	-	-	-
Stage 1	722	675	-	725	674	-	-	-	-	-	-	-
Stage 2	677	660	-	680	669	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	10.9		17.6		0.9		0.8					
HCM LOS	B		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1238	-	-	652	458	1237	-	-				
HCM Lane V/C Ratio	0.022	-	-	0.066	0.379	0.019	-	-				
HCM Control Delay (s)	8	0	-	10.9	17.6	8	0	-				
HCM Lane LOS	A	A	-	B	C	A	A	-				
HCM 95th %tile Q(veh)	0.1	-	-	0.2	1.7	0.1	-	-				




Intersection												
Int Delay, s/veh	4.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↕			↕			↕	
Traffic Vol, veh/h	0	0	0	95	0	103	34	115	0	0	297	35
Future Vol, veh/h	0	0	0	95	0	103	34	115	0	0	297	35
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	21	21	21	21	21	21	24	24	24	24	24	24
Mvmt Flow	0	0	0	106	0	114	38	128	0	0	330	39
Major/Minor				Minor1		Major1		Major2				
Conflicting Flow All				554	573	128	369	0	-	-	-	0
Stage 1				204	204	-	-	-	-	-	-	-
Stage 2				350	369	-	-	-	-	-	-	-
Critical Hdwy				6.61	6.71	6.41	4.34	-	-	-	-	-
Critical Hdwy Stg 1				5.61	5.71	-	-	-	-	-	-	-
Critical Hdwy Stg 2				5.61	5.71	-	-	-	-	-	-	-
Follow-up Hdwy				3.689	4.189	3.489	2.416	-	-	-	-	-
Pot Cap-1 Maneuver				462	405	874	1078	-	0	0	-	-
Stage 1				787	699	-	-	-	0	0	-	-
Stage 2				673	589	-	-	-	0	0	-	-
Platoon blocked, %								-			-	-
Mov Cap-1 Maneuver				444	0	874	1078	-	-	-	-	-
Mov Cap-2 Maneuver				444	0	-	-	-	-	-	-	-
Stage 1				757	0	-	-	-	-	-	-	-
Stage 2				673	0	-	-	-	-	-	-	-
Approach				WB		NB		SB				
HCM Control Delay, s				14.5		1.9		0				
HCM LOS				B								
Minor Lane/Major Mvmt	NBL	NBT	WBLn1	SBT	SBR							
Capacity (veh/h)	1078	-	597	-	-							
HCM Lane V/C Ratio	0.035	-	0.369	-	-							
HCM Control Delay (s)	8.5	0	14.5	-	-							
HCM Lane LOS	A	A	B	-	-							
HCM 95th %tile Q(veh)	0.1	-	1.7	-	-							

Intersection												
Int Delay, s/veh	2.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Traffic Vol, veh/h	13	0	24	0	0	0	0	136	66	128	264	0
Future Vol, veh/h	13	0	24	0	0	0	0	136	66	128	264	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	52	52	52	52	52	52	24	24	24	24	24	24
Mvmt Flow	14	0	27	0	0	0	0	151	73	142	293	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	765	801	293	-	0	0	224	0	0
Stage 1	577	577	-	-	-	-	-	-	-
Stage 2	188	224	-	-	-	-	-	-	-
Critical Hdwy	6.92	7.02	6.72	-	-	-	4.34	-	-
Critical Hdwy Stg 1	5.92	6.02	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.92	6.02	-	-	-	-	-	-	-
Follow-up Hdwy	3.968	4.468	3.768	-	-	-	2.416	-	-
Pot Cap-1 Maneuver	309	267	642	0	-	-	1225	-	0
Stage 1	475	430	-	0	-	-	-	-	0
Stage 2	737	635	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	266	0	642	-	-	-	1225	-	-
Mov Cap-2 Maneuver	266	0	-	-	-	-	-	-	-
Stage 1	409	0	-	-	-	-	-	-	-
Stage 2	737	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.3	0	2.7
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	SBL	SBT
Capacity (veh/h)	-	-	429	1225	-
HCM Lane V/C Ratio	-	-	0.096	0.116	-
HCM Control Delay (s)	-	-	14.3	8.3	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0.4	-

























Intersection						
Int Delay, s/veh	8.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	43	106	146	159	209	79
Future Vol, veh/h	43	106	146	159	209	79
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	6	6	24	24	24	24
Mvmt Flow	48	118	162	177	232	88
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	339	0	-	0	465	251
Stage 1	-	-	-	-	251	-
Stage 2	-	-	-	-	214	-
Critical Hdwy	4.16	-	-	-	6.64	6.44
Critical Hdwy Stg 1	-	-	-	-	5.64	-
Critical Hdwy Stg 2	-	-	-	-	5.64	-
Follow-up Hdwy	2.254	-	-	-	3.716	3.516
Pot Cap-1 Maneuver	1198	-	-	-	517	737
Stage 1	-	-	-	-	742	-
Stage 2	-	-	-	-	772	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1198	-	-	-	495	737
Mov Cap-2 Maneuver	-	-	-	-	495	-
Stage 1	-	-	-	-	710	-
Stage 2	-	-	-	-	772	-
Approach	EB	WB		SB		
HCM Control Delay, s	2.3	0		20.6		
HCM LOS				C		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1198	-	-	-	544	
HCM Lane V/C Ratio	0.04	-	-	-	0.588	
HCM Control Delay (s)	8.1	0	-	-	20.6	
HCM Lane LOS	A	A	-	-	C	
HCM 95th %tile Q(veh)	0.1	-	-	-	3.8	

HCM 2010 Signalized Intersection Summary

15: Volvo Car Drive & Welcome Center/Factory Entrance

2043 Alt 4 Build Conditions

PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	56	0	171	15	0	4	32	386	15	4	593	12
Future Volume (veh/h)	56	0	171	15	0	4	32	386	15	4	593	12
Number	3	8	18	7	4	14	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727	1727
Adj Flow Rate, veh/h	61	0	186	16	0	4	35	420	16	4	645	13
Adj No. of Lanes	1	1	1	1	1	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	10	10	10	10	10	10	10	10	10	10	10	10
Cap, veh/h	345	268	228	275	222	188	233	806	685	374	764	649
Arrive On Green	0.04	0.00	0.16	0.02	0.00	0.13	0.03	0.47	0.47	0.00	0.44	0.44
Sat Flow, veh/h	1645	1727	1468	1645	1727	1468	1645	1727	1468	1645	1727	1468
Grp Volume(v), veh/h	61	0	186	16	0	4	35	420	16	4	645	13
Grp Sat Flow(s),veh/h/ln	1645	1727	1468	1645	1727	1468	1645	1727	1468	1645	1727	1468
Q Serve(g_s), s	2.1	0.0	8.2	0.6	0.0	0.2	0.8	11.5	0.4	0.1	22.3	0.3
Cycle Q Clear(g_c), s	2.1	0.0	8.2	0.6	0.0	0.2	0.8	11.5	0.4	0.1	22.3	0.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	345	268	228	275	222	188	233	806	685	374	764	649
V/C Ratio(X)	0.18	0.00	0.82	0.06	0.00	0.02	0.15	0.52	0.02	0.01	0.84	0.02
Avail Cap(c_a), veh/h	496	413	351	471	413	351	407	825	702	588	825	702
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.9	0.0	27.4	24.8	0.0	25.5	13.5	12.6	9.6	11.0	16.6	10.5
Incr Delay (d2), s/veh	0.2	0.0	8.4	0.1	0.0	0.0	0.3	0.6	0.0	0.0	7.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	3.9	0.3	0.0	0.1	0.4	5.5	0.2	0.0	12.2	0.1
LnGrp Delay(d),s/veh	24.2	0.0	35.7	24.9	0.0	25.6	13.8	13.1	9.6	11.0	24.2	10.5
LnGrp LOS	C		D	C		C	B	B	A	B	C	B
Approach Vol, veh/h	247						20		471		662	
Approach Delay, s/veh	32.9						25.0		13.1		23.8	
Approach LOS	C						C		B		C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.9	35.6	8.8	14.6	6.3	37.2	7.0	16.4				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0				
Max Green Setting (Gmax), s	9.0	32.0	9.0	16.0	9.0	32.0	9.0	16.0				
Max Q Clear Time (g_c+I1), s	2.8	24.3	4.1	2.2	2.1	13.5	2.6	10.2				
Green Ext Time (p_c), s	0.0	5.4	0.0	0.0	0.0	7.1	0.0	0.3				
Intersection Summary												
HCM 2010 Ctrl Delay	21.8											
HCM 2010 LOS	C											