# I-26 & Volvo Car Drive Interchange Justification Report

Berkeley County, South Carolina

Prepared for:

Thomas & Hutton Engineering Co.

Prepared by:

Stantec Consulting Services Inc.

June 2016

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Berkeley County, South Carolina

Stantec

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June 2016

Project No. 171001612


*Signature* *Date*

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# 1.0 Introduction

The purpose of this report is to document an Interchange Justification Report (IJR) for the proposed I-26 & Volvo Car Drive interchange in Berkeley County, South Carolina in accordance with Federal Highway Administration (FHWA) and South Carolina Department of Transportation (SCDOT) guidelines. This report summarizes the procedures and findings of the selection of study design hour, the traffic volume development for the design years, the results of the capacity analyses, and responses to FHWA's eight policy requirements for an Interstate System Access Change Request.

## 1.1 PROJECT BACKGROUND

Car manufacturer Volvo has recently selected Berkeley County to build its first car factory in North America. The proposed factory is located in the 6,800-acre Camp Hall Commerce Park on the north side of I-26 between SC 27/Ridgeville Road (Exit 187) and Jedburg Road (Exit 194). The Volvo factory is expected to accommodate approximately 4,000 employees by 2040. In addition to the Volvo factory, up to 9,900,000 square feet of supporting industrial warehouse and manufacturing development is expected to be developed in the Camp Hall Commerce Park for Volvo-related suppliers and manufacturers.

Several new roadways are planned to support the proposed development of the Camp Hall Commerce Park for Volvo. Volvo Car Drive is planned as the primary north/south roadway connection between I-26 and US 176 providing access to the development. There are two east/west roadway connections between SC 27/Ridgeville Road and Volvo Car Drive planned to provide additional access. They are currently named Westvaco Road and Lower Westvaco Road. A figure illustrating the location of the Volvo-related development, proposed roadways, and overall area is shown in Exhibit 1.1.

The proposed I-26 & Volvo Car Drive project is located near mile marker 189 approximately two miles from SC 27/Ridgeville Road (Exit 187) and approximately five miles from Jedburg Road (Exit 194). The proposed I-26 & Volvo Car Drive interchange configuration is a three-level, three-leg directional interchange that connects I-26 and the Camp Hall Commerce Park via Volvo Car Drive. Directional ramps are proposed for all movements that will be achieved through three bridge structures. Due to the expected high attraction to/from the Charleston area, the ramps to/from Charleston are proposed to be constructed as two-lane ramps.

A figure illustrating a concept of the proposed I-26 & Volvo Car Drive interchange is shown in Exhibit 1.2 and a figure illustrating a conceptual guide sign plan for the proposed interchange is shown in Exhibit 1.3.


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**I-26 & Volvo Car Drive IJR**
Exhibit 1.1 - Project Location Map

SC 27/OLD GILLIARD ROAD

SC 27/RIDGEVILLE ROAD

BERKELEY COUNTY

DORCHESTER COUNTY

TIMOTHY CREEK

THOMPSON CREEK

CYPRESS CAMPGROUND ROAD

## INTERCHANGE CONCEPT

LEGEND

- Proposed Ramp
- Proposed Bridge
- Existing Roadway (Horizon Year)
- Number of Proposed Lanes
- Existing Water Feature
- County Line
- Existing Property Line
- Proposed Right-of-Way
- Existing Wetlands

SCALE IN FEET

0 350 700 1400

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**Exhibit 1.2 - I-26 & Volvo Car Drive Interchange Concept**
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VOLVO CAR DRIVE
I-26 WESTBOUND
I-26 EASTBOUND
EAST
Charleston
WEST
Columbia
26
(OVERHEAD)
EXIT 189
Volvo Car Drive
1 MILE
EXIT ONLY
Columbia RIGHT LANE
(OVERHEAD)
(TO BE IN PLACE UNTIL THIRD WESTBOUND LANE IS ADDED)
(TO BE INSTALLED WITH THE WIDENING OF I-26 WESTBOUND TO THREE LANES)
SCALE IN FEET
0 250 500 1000

## 1.2 EXISTING ROADWAY CONDITIONS

I-26 is a four-lane interstate freeway that connects the Charleston area with the rest of South Carolina, including I-95 and the Columbia area. In the area of the proposed interchange, I-26 is divided by a wide grassed median and has a posted speed limit of 70 mph. The 2014 AADT along I-26 between SC 27/Ridgeville Road and Jedburg Road was 39,900 vpd and based upon classification data from the week of May 4, 2015, the percentage of heavy vehicles along I-26 between SC 27/Ridgeville Road and Jedburg Road is approximately 20%.

SC 27/Ridgeville Road is a two-lane major collector that primarily serves rural residential land uses. The 2014 AADT was 1,900 vpd north of I-26 and 8,400 vpd south of I-26. The posted speed limit is 55 mph from US 78 to near I-26, 45 mph through the I-26 interchange area, and 50 mph north to Westvaco Road. Based upon existing turning movement counts, the percentage of heavy vehicles along SC 27/Ridgeville Road is approximately 11%.

Jedburg Road is a two-lane major collector that primarily serves residential land uses. The 2014 AADT was 5,200 vpd north of I-26 and 10,700 south of I-26. The posted speed limit is 45 mph through the I-26 interchange area. Based upon existing turning movement counts, the percentage of heavy vehicles along Jedburg Road is approximately 6%.

## 1.3 FUTURE ROADWAY IMPROVEMENTS

As part of the IJR analyses, two future roadway projects were considered.

A new interchange at Sheep Island Parkway (new Exit 197) is planned to be constructed approximately three miles south of Jedburg Road (Exit 194). Improvements to the I-26 & Sheep Island Parkway and I-26 & Jedburg Road interchanges are documented in the May 2010 *Sheep Island Parkway IJR/Jedburg Road Interchange Modification Report (IMR)*. Improvements to the I-26 & Jedburg Road interchange were assumed to be in place as part of the 2019 and 2039 analyses and include the widening of Jedburg Road to a four-lane, median divided section in the interchange area and the addition of an I-26 westbound-to-Jedburg Road southbound loop off-ramp.

The widening of I-26 from SC 27/Ridgeville Road (Exit 187) to US 17A (Exit 199) to six lanes divided by a grass median is programmed in the South Carolina Statewide Transportation Improvement Program (STIP) for preliminary engineering in 2015. For the 2039 Build and No Build analyses, the widening of I-26 to a six-lane section from west of SC 27/Ridgeville Road to east of Jedburg Road was assumed to be in place.

## 1.4 STATEMENT OF NEED

Car manufacturer Volvo has recently selected Berkeley County to build its first car factory in North America. The Volvo factory is expected to accommodate approximately 4,000 employees by 2040. In addition to the Volvo factory, up to 9,900,000 square feet of supporting industrial warehouse and manufacturing development is expected to be developed in the Camp Hall Commerce Park for Volvo-related suppliers and manufacturers. The proposed I-26 & Volvo Car Drive interchange project is required to accommodate the design-year traffic demands from the new Volvo factory and supporting Volvo-related suppliers and manufacturers.

Based upon the results of 2039 No Build conditions, the three intersections along SC 27/Ridgeville Road between I-26 and Lower Westvaco Road are projected to operate at severe LOS F conditions that would represent gridlock along SC 27/Ridgeville Road. This gridlock will likely cause severe queuing on the I-26 off-ramps to SC 27/Ridgeville Road, which could potentially back-up to the I-26 mainlines in both directions. The severe failing conditions along SC 27/Ridgeville Road can be attributed to all of the Volvo-related traffic being assigned to that roadway to access I-26.

The results of an improvement analysis scenario indicate a typical widening improvement along SC 27/Ridgeville Road – including widening to a four-lane, median divided cross section; controlling access between I-26 and Lower Westvaco Road; and increasing the spacing of the I-26 ramp intersections from 700 feet to 1,320 feet – would not accommodate the 2039 No Build traffic demands. The two I-26 ramp intersections along SC 27/Ridgeville Road would still be projected to operate at severe LOS F conditions – although less severe than without improvements – that would still represent gridlock along SC 27/Ridgeville Road, which could still potentially back-up to the I-26 mainlines in both directions. The severe failing conditions along SC 27/Ridgeville Road can be attributed to all of the Volvo-related traffic being assigned to that roadway to access I-26.

Therefore, based upon the results of the 2039 No Build conditions analysis and the 2039 No Build conditions with improvements analysis, the I-26 & Volvo Car Drive interchange is justified and needed to accommodate design-year traffic demands of the new Volvo factory and the supporting industrial warehouse and manufacturing development of Volvo-related suppliers and manufacturers of the Camp Hall Commerce Park.

In addition, it should be noted that the proposed two points of access to I-26 through Volvo Car Drive and SC 27/Ridgeville Road for the Volvo factory and Volvo-related industrial development would be equal to the access of the existing BMW factory in Greer, South Carolina.

## 1.5 IJR ANALYSIS METHODOLOGY

Numerous coordination meetings have been held to discuss and agree to the IJR analysis methodology and assumptions. The meetings' attendees have included U. S. Army Corps of Engineers (USACE), FHWA, SCDOT, SC Department of Commerce, and project consultant staffs. The following documents a summary of assumptions agreed to and used in the analyses. The analyses were conducted in accordance with FHWA's *Interstate System Access Informational Guide* (August 2010).

The proposed I-26 & Volvo Car Drive interchange is planned to be opened in 2019; therefore, the design years of the IJR analyses are opening-year 2019 conditions and horizon-year 2039 conditions. For the IJR analyses, Build and No Build conditions of the proposed interchange for the respective analysis years have been considered.

The adjacent interchanges of I-26 & SC 27/Ridgeville Road and I-26 & Jedburg Road were considered in the project study area.

The Volvo factory is planned to open in 2017 with approximately 1,000 manufacturing employees. The Volvo factory is projected to increase to 4,000 employees by 2040. In 2017, it is expected that approximately 1,000,000 square feet of Volvo-related suppliers and manufacturers would be operating with approximately 1,000 additional employees. By 2040, it is projected that the Volvo-related suppliers and manufacturers will total approximately 9,900,000 square feet of industrial uses in the Camp Hall Commerce Park. For the purposes of this analysis, a conservative ratio of 1.0 employees per 1,000 square feet of industrial development was utilized for the Volvo-related industrial development. The ratio of 1.0 employees per 1,000 square feet of development is the same ratio that is utilized by the CHATS regional transportation model for trip generation and was determined to be conservative when compared to data from existing developments in Georgia which have ratios ranging from 1.0 employees per 2,415 square feet to 1.0 employees per 5,890 square feet.

To develop an annual background growth rate for traffic in the study area, including I-26, not related to the Volvo factory and Volvo-related industrial development, three sources of data were reviewed: historical count data along I-26 between SC 27/Ridgeville Road and Jedburg Road (SCDOT count station #2179) over the past 10 years; growth rate assumptions from the May 2010 *Sheep Island Parkway IJR/Jedburg Road IMR;* and traffic volume projections of BCDCOG's Charleston Area Transportation Study (CHATS) travel demand model.

# 2.0 Selection of Design Hour

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 shall 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 Handbook,* 6th Edition (2012) 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 rural 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 rural 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. In reality, the 30th highest hour may or may not be the correct choice to identify the design-hour volume.

For the proposed I-26 & Volvo Car Drive interchange, 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 P-54 along I-26 between SC 27/Ridgeville Road and Jedburg Road between May 2014 and April 2015. The results of the review indicated that the majority of the highest 30 hours and 100 hours are Friday afternoons, which is likely due to the high amount of tourist traffic coming into the Charleston area for the weekends via I-26 eastbound during the normal commuter afternoon peak heading out of the Charleston area via I-26 westbound. A graph of the volume data was created and no discernible "knee" is visible. The 100 highest hours occurred on only 41 different days, and the only hours of the top 100 occurring on non-Fridays were related to holiday travel:

- Sunday, April 5, 2015 – Easter Sunday;
- Sunday, April 12, 2015 – the Sunday after the Berkeley County School District spring break week;
- Sunday, July 6, 2014 – the Sunday after the July 4th holiday; and
- Tuesday, November 25, 2014; Wednesday, November 26, 2014; and Sunday, November 30, 2014 – before and after the Thanksgiving holiday.

Based upon 30 and 100 highest hours, it was agreed that selecting a Friday time period due to holiday travel did not seem appropriate and would potentially result in an uneconomical and excessive design for the new interchange. Therefore, Fridays containing the top 100 highest hours of the year during non-holiday weekends were reviewed to determine a representative day for the analysis. It was determined and agreed to that Friday, October 3, 2014 would be an appropriate representative day since it contained four consecutive hours in the afternoon that fell in the top 100, including two hours that fell in the top 49. A summary of the two-way volumes for this day and corresponding yearly volume rank is provided below.

- 2:00 – 3:00 PM: 4,160, 98th highest hour
- 3:00 – 4:00 PM: 4,407, 41st highest hour – Study Design Hour
- 4:00 – 5:00 PM: 4,342, 49th highest hour
- 5:00 – 6:00 PM: 4,164, 97th highest hour

With consideration of the projected peak Volvo volumes that are discussed in the next section, it was determined that the 3:00 – 4:00 PM hour would be the I-26 & Volvo Car Drive IJR Study Design Hour. The selection of this design hour is within the range of hours specified in standard practices and methodologies and reflects best design practices for the unique circumstances and context of this section of I-26 in Berkeley County.

# 3.0 Traffic Volume Development

For the IJR analyses, opening-year 2019 and horizon-year 2039 conditions were considered. For both of the respective study years, Build and No Build conditions of the proposed interchange were evaluated. Existing 2015 traffic volumes were collected along SC 27/Ridgeville Road and Jedburg Road for use in the analysis; the development of the I-26 Design Hour was discussed in the previous section; and the horizon-year 2039 traffic volumes along Jedburg Road were based upon information in the May 2010 *Sheep Island Parkway IJR/Jedburg Road IMR* document.

## 3.1 BACKGROUND GROWTH RATE

To develop an annual background growth rate for traffic not related to the Volvo factory and Volvo-related industrial development, three sources of data were reviewed: historical count data along I-26 between SC 27/Ridgeville Road and Jedburg Road (SCDOT count station #2179) over the past 10 years; growth rate assumptions from the May 2010 *Sheep Island Parkway IJR/Jedburg Road IMR;* and traffic volume projections of BCDCOG's Charleston Area Transportation Study (CHATS) travel demand model.

Based upon the historical data, I-26 between SC 27/Ridgeville Road and Jedburg Road has experienced approximately 0.87% annual growth. The May 2010 *Sheep Island Parkway IJR/Jedburg Road IMR* considered an annual growth assumption of 2.1%. The CHATS travel demand model projects approximately 1.85% annual growth along I-26 considering 2040 projections.

Based upon this information, a 2.0% annual linear growth rate was utilized to develop opening-year 2019 and horizon-year 2039 traffic volumes not related to the Volvo factory and Volvo-related industrial development. For Jedburg Road, the May 2010 *Sheep Island Parkway IJR/Jedburg Road IMR* traffic volumes for 2035 conditions were utilized and grown to horizon-year 2039 conditions using the 2.0% annual growth rate.

## 3.2 OPENING-YEAR 2019 TRAFFIC VOLUMES

The opening-year 2019 traffic volumes were developed for projected 2019 conditions by applying an annual growth rate to the existing traffic volumes and adding the projected traffic volumes of the Volvo factory, Volvo-related industrial development, and construction traffic.

### 3.2.1 Volvo Developments Trip Generation (2019)

The trip generation potential of the Volvo factory and Volvo-related industrial development was developed based upon information of other large-scale manufacturing factories in South Carolina, including the BMW factory in Greer, South Carolina. The trip generation for the developments was separated into three land uses, Volvo Office, Volvo Manufacturing, and Volvo-related Industrial. The trip generation potential was also estimated for construction traffic associated with the Volvo Manufacturing and Volvo-Related Industrial developments during the 2019 analyses.

- *Volvo Office (200 employees):* the trip generation was estimated using information contained in ITE's *Trip Generation Manual*, 9th Edition (2012) reference for land use code 710 – General Office Building.
- *Volvo Manufacturing (1,000 employees):* the trip generation was estimated considering 1.0 employees per vehicle and a 90%/10% directional split during ingress and egress. This assumption is based upon the trip generation characteristics of other large-scale manufacturing factories in South Carolina.
- *Volvo-Related Industrial Development (1,000,000 square feet):* for the purposes of this analysis, a conservative ratio of 1.0 employees per 1,000 square feet of industrial development was utilized for the Volvo-related industrial development. The trip generation was estimated using information contained in ITE's *Trip Generation Manual*, 9th Edition (2012) reference for land use codes 140 – Manufacturing and 150 – Warehousing. It was assumed that approximately 60% of the Volvo-related industrial development would be manufacturing (600 employees by 2019) and approximately 40% of the Volvo-related industrial development would be warehousing (400 employees by 2019).
- *Construction (500 employees by 2019):* the trip generation was estimated considering 1.0 employees per vehicle and a 90%/10% directional split during ingress and egress.

Due to the conservative estimate of additional construction traffic and considering the limited opening-year operations of the Volvo factory and Volvo-Related Industrial developments, potential truck trips generated by the manufacturing facilities were not considered as additional trips. Instead, a heavy vehicle percentage of 20% was utilized for the opening year capacity analyses, as discussed in section 4.0.

The total 2019 opening year trip generation estimates for the Volvo developments are shown in Table 3.1 and documented in Appendix A.

**Table 3.1 – Opening-Year 2019 Trip Generation Summary**

| Land Use | Scale | Ingress Peak | | Egress Peak | |
|---|---|---|---|---|---|
| | | Entering | Exiting | Entering | Exiting |
| Volvo Office | 200 employees | 105 | 15 | 25 | 110 |
| Volvo Manufacturing | 1,000 employees | 900 | 100 | 100 | 900 |
| Volvo-Related Industrial | 1,000 employees | 325 | 125 | 185 | 285 |
| Construction | 500 employees | 450 | 50 | 50 | 450 |

### 3.2.2 Volvo Developments Shifts (2019)

Based upon the trip generation results, the trips were distributed throughout the day considering one shift. The shift assumptions are summarized herein.

- *Volvo Office:* it was assumed that the office operations would occur during typical workday operations, from 8:30 AM – 5:00 PM, with 10% of the PM peak hour trips occurring during the 3:00 – 4:00 PM Design Hour.
- *Volvo Manufacturing:* it was assumed that manufacturing would be one shift for opening-year 2019 conditions beginning at 6:30 AM, which is the start time of the 1st shift of Volvo's existing Gothenburg, Sweden factory. It was assumed that the shift would end at 3:00 PM, with 100% of the PM peak hour trips occurring during the 3:00 PM – 4:00 PM Design hour.
- *Volvo-Related Industrial Development:* it was assumed that 25% of the Volvo-related industrial development traffic would coincide with the Volvo Manufacturing operations during the 3:00 – 4:00 PM design hour.
- *Construction:* it was assumed that 40% of the construction-related traffic would coincide with the Volvo Manufacturing operations during the 3:00 PM – 4:00 PM Design Hour.

### 3.2.3 Trip Distribution (2019)

Traffic expected to be generated by the Volvo factory and Volvo-related industrial development for opening-year 2019 conditions was distributed and assigned to the adjacent roadway network.

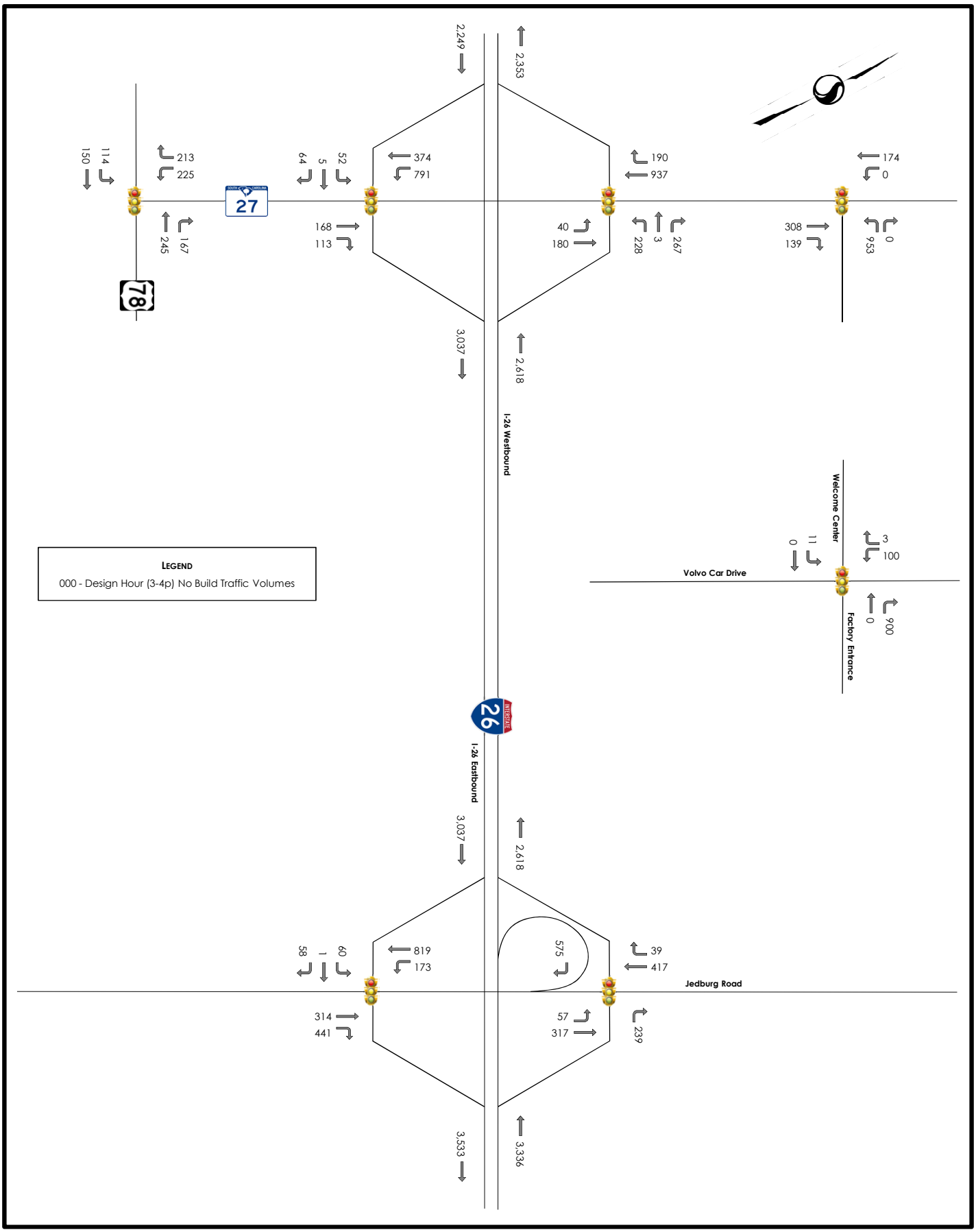
The distribution was based upon the location of existing population centers and census tract information for the four counties of Berkeley, Charleston, Dorchester, and Orangeburg. The distribution also considered future residential development projects and expected travel patterns for the Volvo factory and Volvo-related industrial development. The distribution agreed to by USACE, FHWA, SCDOT, SC Department of Commerce, and project consultant staffs during the coordination meetings is:

- 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/Ridgeville Road;
- 4% to/from the east via US 78 and SC 27/Ridgeville Road;
- 8% to/from the west via US 176; and
- 10% to/from the east via US 176.

### 3.2.4 Opening-year 2019 Traffic Volume Development Summary

Based upon the traffic volume development impacts of the Volvo factory and Volvo-related industrial development and considering the 2.0% annual growth rate, the effective annual growth rate along I-26 eastbound between Volvo Car Drive and Jedburg Road (the peak direction during the Volvo Manufacturing egress) during the 3:00 – 4:00 PM Design Hour is approximately 10.1% per year. Worksheets documenting the traffic volume development are provided in Appendix B.

Figures illustrating the proposed opening-year Design Hour traffic volumes for No Build and Build conditions are shown in Exhibits 3.1 and 3.2, respectively.


LEGEND
000 - Design Hour (3-4p) No Build Traffic Volumes
I-26 Westbound
I-26 Eastbound
Volvo Car Drive
Welcome Center
Factory Entrance
Jedburg Road
27
78
26
2,249
2,353
3,037
2,618
213
225
114
150
245
167
64
5
52
374
791
168
113
190
937
40
180
228
3
267
174
0
308
139
953
0
11
0
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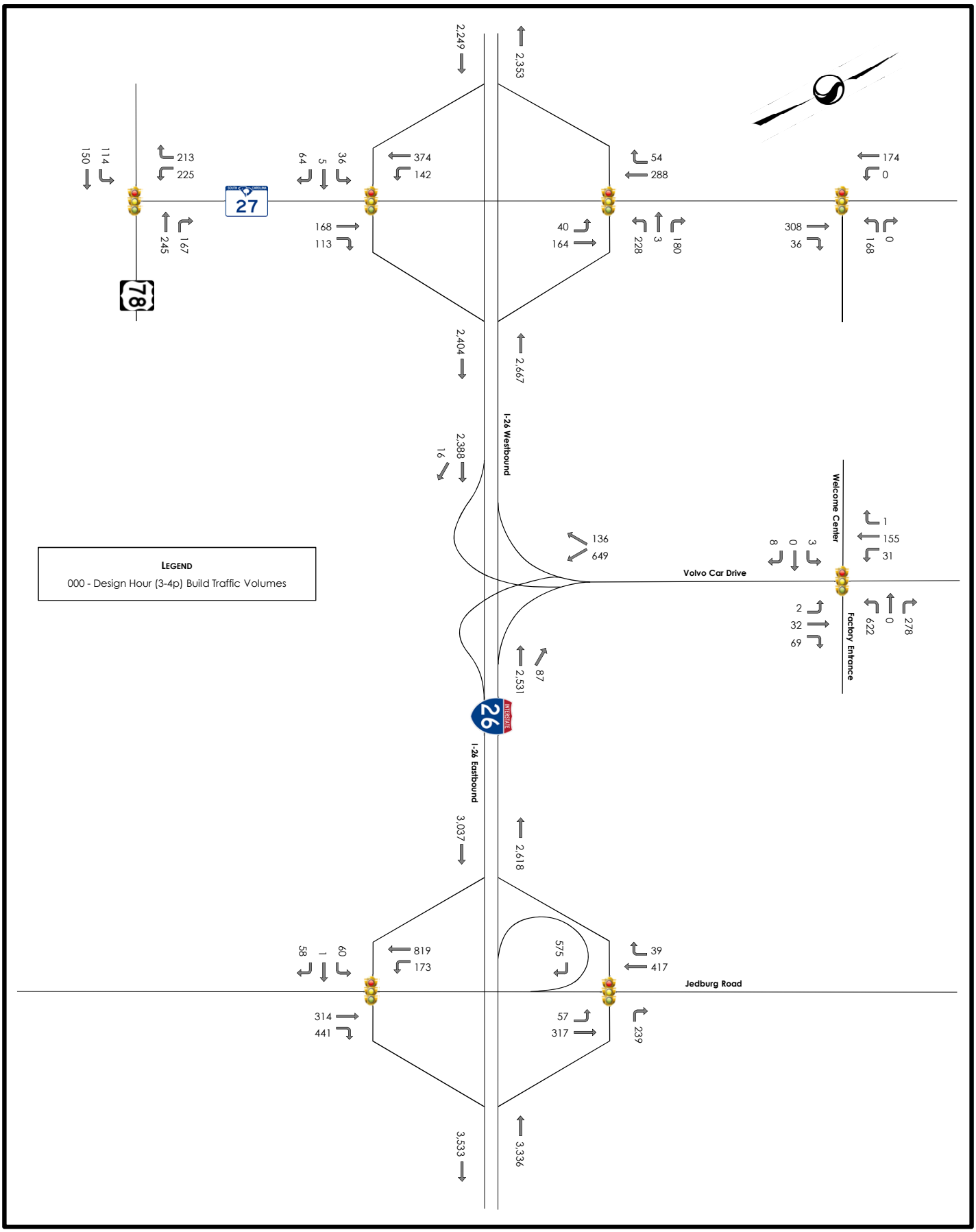
39
417
314
441
57
317
239
3,533
3,336


LEGEND
000 - Design Hour (3-4p) Build Traffic Volumes
I-26 Westbound
I-26 Eastbound
Volvo Car Drive
Jedburg Road
Welcome Center
Factory Entrance
27
78
26
2,249
2,353
2,404
2,667
2,388
16
2,531
87
3,037
2,618
3,533
3,336
150
114
213
225
245
167
64
5
36
374
142
168
113
54
288
40
164
228
3
180
174
0
308
36
168
136
649
1
155
31
8
0
3
2
32
69
622
278
58
1
60
819
173
575
39
417
314
441
57
317
239

## 3.3 HORIZON-YEAR 2039 TRAFFIC VOLUMES

The horizon-year 2039 traffic volumes were developed for projected 2039 conditions by applying an annual growth rate to the existing traffic volumes and adding the projected traffic volumes of the Volvo factory and Volvo-related industrial development, with the exception of the Jedburg Road volumes, which were based upon the May 2010 *Sheep Island Parkway IJR/Jedburg Road IMR* document.

### 3.3.1 Volvo Developments Trip Generation (2039)

The trip generation potential of the Volvo factory and Volvo-related industrial development was developed based upon information of other large-scale manufacturing factories in South Carolina, including the BMW factory in Greer, South Carolina. The trip generation for the developments was separated into three land uses, Volvo Office, Volvo Manufacturing, and Volvo-related Industrial. Additional truck trips generated by the manufacturing facilities were considered in the horizon year.

- *Volvo Office (500 employees):* the trip generation was estimated using information contained in ITE's *Trip Generation Manual*, 9th Edition (2012) reference for land use code 710 – General Office Building.
- *Volvo Manufacturing (4,000 employees):* the trip generation was estimated considering 1.0 employees per vehicle and a 90%/10% directional split during ingress and egress. This assumption is based upon the trip generation characteristics of other large-scale manufacturing factories in South Carolina.
- *Volvo Manufacturing Trucks (712 trucks daily):* the trip generation was estimated based on a production-based rate provided by Volvo Cars. The estimated trips were distributed throughout the entire 24-hours of operation for the Volvo Factory and a 50%/50% directional split for ingress and egress was assumed.
- *Volvo-Related Industrial Development (9,900,000 square feet):* using a conservative ratio of 1.0 employees per 1,000 square feet of industrial development, the trip generation was estimated using information contained in ITE's *Trip Generation Manual*, 9th Edition (2012) reference for land use codes 140 – Manufacturing and 150 – Warehousing. It was assumed that approximately 60% of the Volvo-related industrial development would be manufacturing (6,000 employees by 2039) and approximately 40% of the Volvo-related industrial development would be warehousing (3,900 employees by 2039).
- *Volvo-Related Industrial Development Trucks (10% of employee trips):* the trip generation was estimated considering additional truck trips equal to 10% of the total Volvo-Related Industrial Development employee trips, which is approximately 360 trucks entering daily and 285 trucks exiting daily.

The total horizon-year 2039 trip generation estimates for the Volvo developments are shown in Table 3.2 and documented in Appendix A.

**Table 3.2 – Horizon-Year 2039 Trip Generation Summary**

| Land Use | Scale | Ingress Peak | | Egress Peak | |
|---|---|---|---|---|---|
| | | Entering | Exiting | Entering | Exiting |
| Volvo Office | 500 employees | 240 | 31 | 41 | 210 |
| Volvo Manufacturing | 4,000 employees | 3,600 | 400 | 400 | 3,600 |
| Volvo Manufacturing Trucks | 712 trucks daily | 32 | 32 | 50 | 50 |
| Volvo-Related Industrial | 9,900 employees | 2,355 | 890 | 1,250 | 1,950 |
| Volvo-Related Industrial Trucks | 10% of employee trips | 235 | 90 | 125 | 195 |

### 3.3.2 Volvo Developments Shifts (2039)

Based upon the total trip generation results, the trips were distributed throughout the day based upon several shifts. The shift potential of the Volvo factory and Volvo-related industrial development was developed based upon data of other large-scale manufacturing factories in South Carolina, including the BMW factory in Greer, South Carolina.

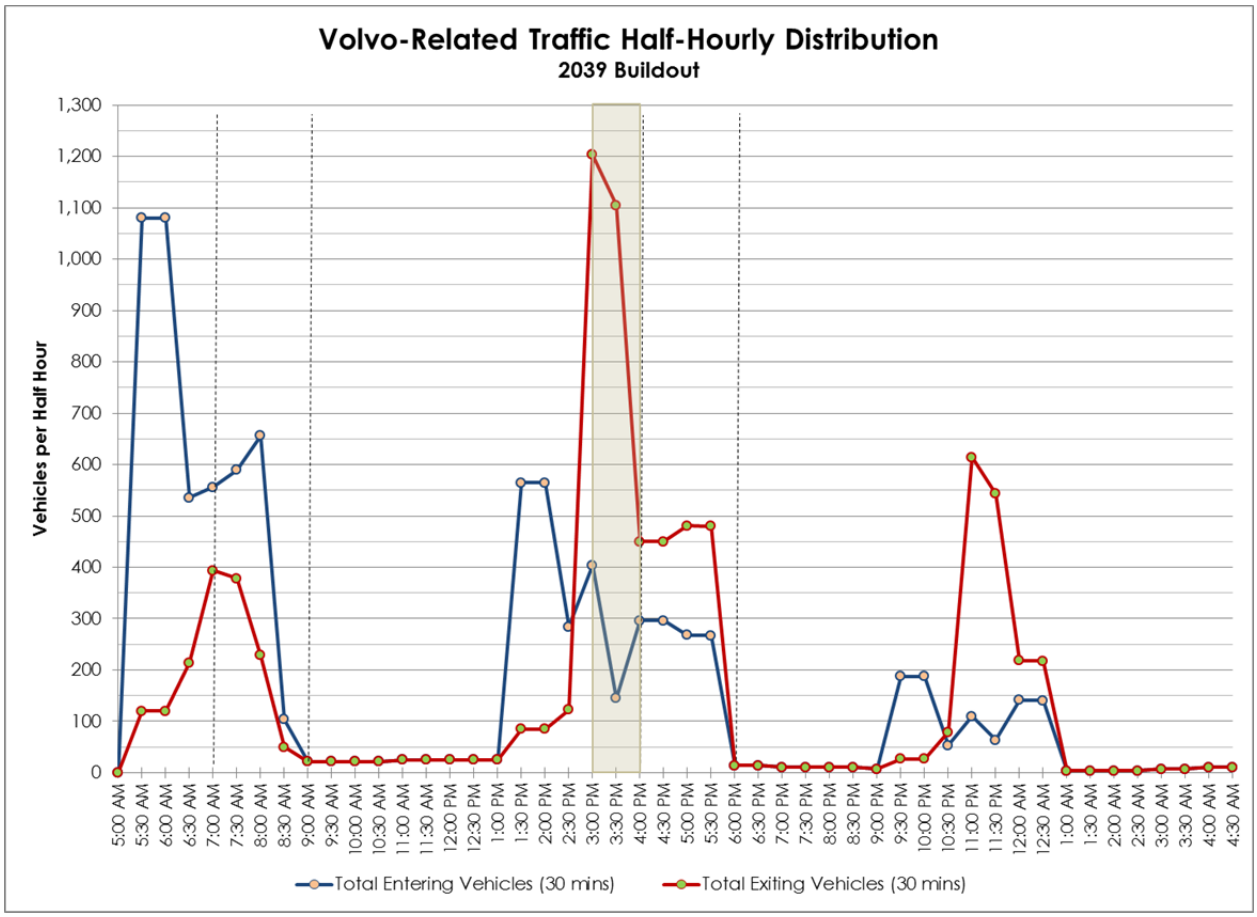
- *Volvo Office:* it was assumed that the office operations would occur during typical workday operations, from 8:30 AM – 5:00 PM.
- *Volvo Manufacturing (employees):* it was assumed that manufacturing would be separated into three shifts, with 60% of the employees working during the 1st shift, 30% of the employees working during the 2nd shift, and 10% of the employees working during the 3rd shift. It was assumed that the 1st shift would begin at 6:30 AM, which is the start time of the 1st shift of Volvo's existing Gothenburg, Sweden factory. The starts of the 2nd and 3rd shifts were assumed to be staggered by 8 hours and 16 hours respectively from the 1st shift. It was assumed that the egress of the 1st shift would be from 3:00 – 4:00 PM and that the egress of the 2nd and 3rd shifts would be staggered by 8 hours and 16 hours respectively.
- *Volvo Manufacturing Trucks:* it was assumed that the truck trips generated by the Volvo factory would be distributed throughout the day based upon the existing hourly distribution of trucks along I-26 as determined by data collected from SCDOT ATR station P-54 along I-26 between SC 27/Ridgeville Road and Jedburg Road.
- *Volvo-Related Industrial Development (employees and trucks):* it was assumed that one-third of the Volvo-related industrial development would operate similar to the Volvo office operations from 8:30 AM – 5:00 PM. It was assumed that the other two-thirds of the Volvo-related development would operate on three shifts similar to the Volvo Manufacturing operations, but staggered one hour later with the Volvo-related industrial development 1st shift beginning at 7:30 AM. It was assumed that the egress of the 1st shift would be from 4:00 – 5:00 PM and the ingress of the 2nd shift would be from 2:30 – 3:30 PM.

The shift assumptions are summarized in Table 3.3 and documented in Appendix A. The resulting half-hourly distribution of Volvo-related traffic is illustrated in Exhibit 3.3.

**Table 3.3 – Horizon-Year 2039 Shift Assumptions Summary**

| Land Use | Shift | % of Workers in Shift | Operation Hours | Ingress Peak | Egress Peak |
|---|---|---|---|---|---|
| Volvo Office | -- | -- | 8:30 AM – 5:00 PM | 7:30 AM to 8:30 AM | 5:00 PM to 6:00 PM |
| Volvo Manufacturing (employees) | 1st | 60% | 6:30 AM to 3:00 PM | 5:30 AM to 6:30 AM | 3:00 PM to 4:00 PM |
| | 2nd | 30% | 2:30 PM to 11:00 PM | 1:30 PM to 2:30 PM | 11:00 PM to 12:00 AM |
| | 3rd | 10% | 10:30 PM to 7:00 AM | 9:30 PM to 10:30 PM | 7:00 AM to 8:00 AM |
| Volvo Manufacturing (trucks) | -- | -- | 24-hours | 11:00 AM to 4:00 PM | 11:00 AM to 4:00 PM |
| Volvo-Related Industrial Office | -- | -- | 8:30 AM – 5:00 PM | 7:30 AM to 8:30 AM | 5:00 PM to 6:00 PM |
| Volvo-Related Industrial (employees and trucks) | 1st | 60% | 7:30 AM to 4:00 PM | 6:30 AM to 7:30 AM | 4:00 PM to 5:00 PM |
| | 2nd | 30% | 3:30 PM to 12:00 AM | 2:30 PM to 3:30 PM | 12:00 AM to 1:00 AM |
| | 3rd | 10% | 11:30 PM to 8:00 AM | 10:30 PM to 11:30 PM | 8:00 AM to 9:00 AM |

**Exhibit 3.3 – Volvo-Related Traffic Half-Hourly Distribution**



The peak of the Volvo-related traffic throughout the day occurs between 3:00 PM and 4:00 PM with the egress of the Volvo Manufacturing 1st-shift employees. This 3:00 PM to 4:00 PM hour corresponds to the I-26 Design Hour and was considered the selected Design Hour for the IJR analyses.

The peak of ingress for Volvo-related traffic throughout the day occurs between 5:30 AM and 6:30 AM. Due to the fact that the ingress peak is less than the egress peak and that the ingress peak time period occurs away from the typical AM peak period (between 7:00 AM and 9:00 AM) for I-26 and area traffic, the ingress peak time period was not considered in the IJR analyses, with the exception of the Factory Entrance analyses discussed in section 4.2.4.

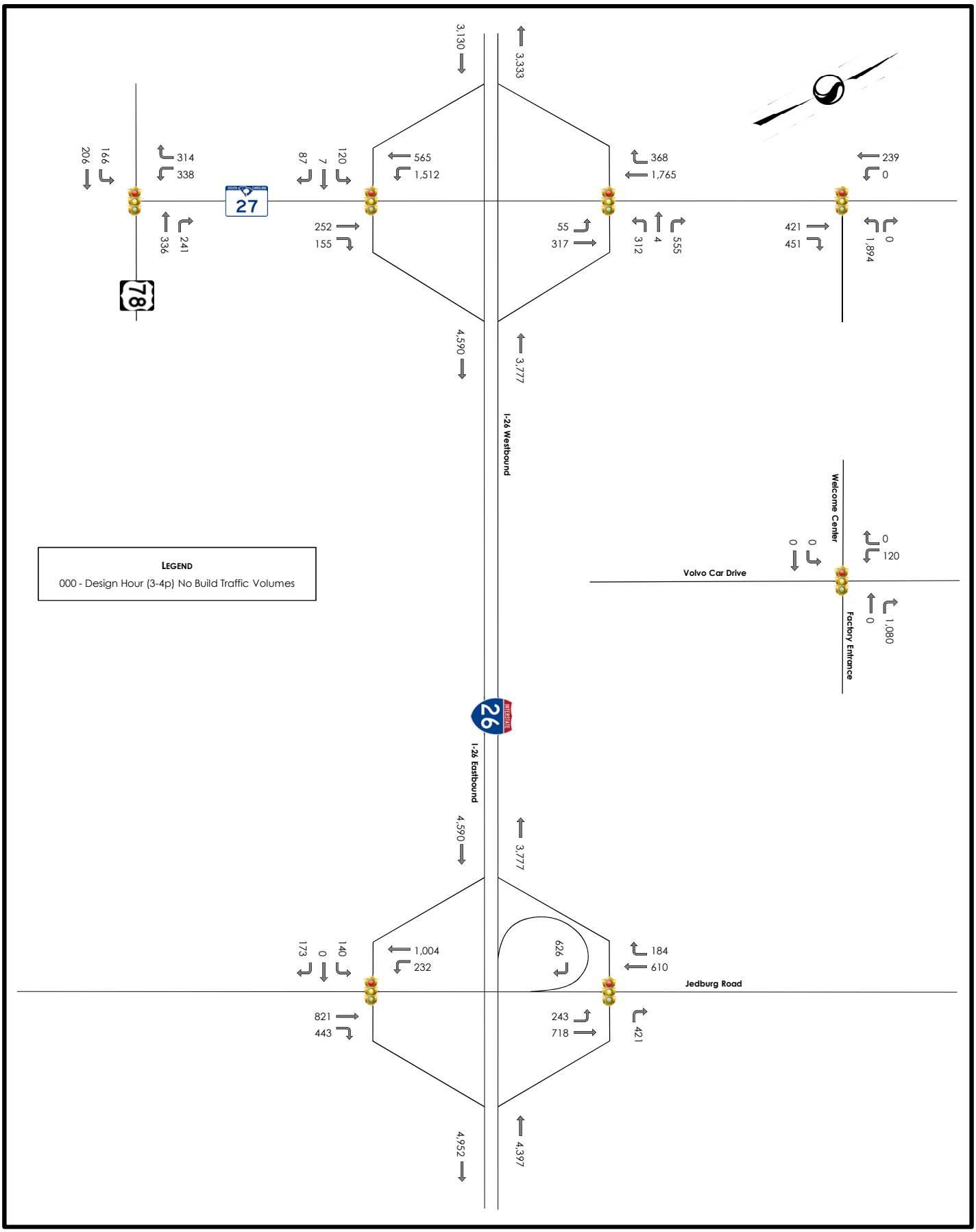
### 3.3.3 Trip Distribution (2039)

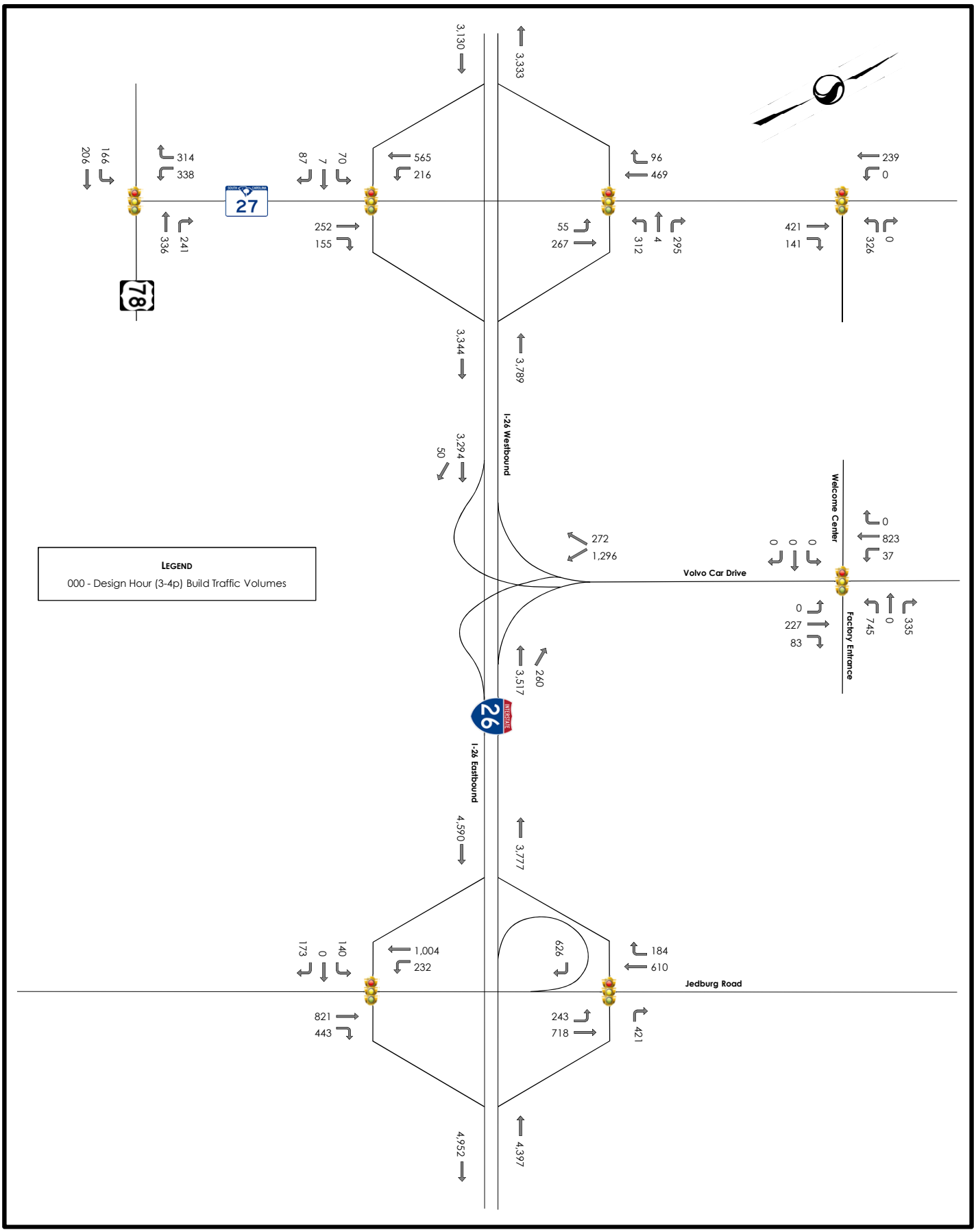
Employee traffic expected to be generated by the Volvo factory and Volvo-related industrial development for horizon-year 2039 conditions was distributed and assigned to the adjacent roadway network based upon the assumptions for opening-year 2019 conditions as documented in Section 3.2.3. Truck traffic, as described in Section 3.3.1, was distributed in the same manner as employee traffic.

### 3.3.4 Horizon-year 2039 Traffic Volume Development Summary

Based upon the traffic volume development impacts of the Volvo factory and Volvo-related industrial development and considering the 2.0% annual growth rate, the effective annual growth rate along I-26 eastbound between Volvo Car Drive and Jedburg Road (the peak direction during the Volvo Manufacturing egress) during the 3:00 – 4:00 PM Design Hour is approximately 4.7% per year. Worksheets documenting the traffic volume development are provided in Appendix C.

Figures illustrating the proposed horizon-year 2039 Design Hour traffic volumes for No Build and Build conditions are shown in Exhibits 3.4 and 3.5, respectively.


3,130
3,333
166
206
314
338
120
7
87
565
1,512
368
1,765
239
0
27
252
155
55
317
312
4
555
421
451
0
1,894
336
241
78
4,590
3,777
I-26 Westbound
Welcome Center
0
0
0
120
Volvo Car Drive
0
1,080
Factory Entrance
LEGEND
000 - Design Hour (3-4p) No Build Traffic Volumes
26
I-26 Eastbound
4,590
3,777
140
0
173
1,004
232
626
184
610
Jedburg Road
821
443
243
718
421
4,952
4,397


LEGEND
000 - Design Hour (3-4p) Build Traffic Volumes
I-26 Westbound
I-26 Eastbound
Volvo Car Drive
Jedburg Road
Welcome Center
Factory Entrance
27
78
26
3,130
3,333
3,344
3,789
3,294
50
3,517
260
4,590
3,777
4,952
4,397
272
1,296
206
166
314
338
336
241
87
7
70
565
216
252
155
55
267
96
469
312
4
295
239
0
421
141
326
0
0
0
0
0
823
37
0
227
83
745
0
335
173
0
140
1,004
232
626
184
610
821
443
243
718
421

# 4.0 Capacity Analysis

Using the projected opening-year 2019 and horizon-year 2039 traffic volumes for No Build and Build conditions of the proposed I-26 & Volvo Car Drive interchange, capacity analyses were conducted for the study area freeway facilities and intersections using the *Highway Capacity Software (HCS 2010)* and the *Highway Capacity Manual 2010 (HCM 2010*) methodologies of the *Synchro* Version 9 software. The *Synchro* analyses were conducted at a planning level and exact signal timings and phases will be determined during the design phase in accordance with the SCDOT *Signal Design Guidelines*.

Level of service (LOS) grades range from LOS A to LOS F, which are directly related to traffic density of freeway facilities and the level of control delay at intersections. LOS A operations typically represent ideal, free-flow conditions where vehicles experience low densities or little delays, and LOS F operations typically represent poor, forced-flow (bumper-to-bumper) conditions with high densities or vehicular delays and are generally considered undesirable. Table 4.1 summarizes the *HCM 2010* density and control delay thresholds associated with each LOS grade for freeway facilities and signalized intersections.

**Table 4.1 – HCM 2010 LOS Criteria**

| LOS | Ramp Merge & Diverge Areas | Freeway Segments |
|---|---|---|
| | Density (passenger cars/mile/lane) | |
| A | ≤ 10 | ≤ 11 |
| B | > 10 and ≤ 20 | > 11 and ≤ 18 |
| C | > 20 and ≤ 28 | > 18 and ≤ 26 |
| D | > 28 and ≤ 35 | > 26 and ≤ 35 |
| E | > 35 | > 35 and ≤ 45 |
| F | Demand exceeds capacity | > 45 |

| Signalized Intersections | |
|---|---|
| LOS | Delay Per Vehicle (seconds) |
| A | ≤ 10 |
| B | > 10 and ≤ 20 |
| C | > 20 and ≤ 35 |
| D | > 35 and ≤ 55 |
| E | > 55 and ≤ 80 |
| F | > 80 |

As part of the analyses, a peak hour factor of 0.90 and truck percentage of 20% were assumed for all freeway facilities and intersections. The truck percentage was based upon existing data collected from SCDOT ATR station P-54 along I-26 between SC 27/Ridgeville Road and Jedburg Road.

## 4.1 OPENING-YEAR 2019 ANALYSES

For 2019 Build conditions, the proposed I-26 & Volvo Car Drive interchange configuration is a three-level, three-leg directional interchange that connects I-26 and the Camp Hall Commerce Park via Volvo Car Drive. Directional ramps are proposed for all movements that will be achieved through three bridge structures. Due to the expected high attraction to/from the Charleston area, the ramps to/from Charleston are proposed to be constructed as two-lane ramps. All proposed new ramp lengths exceed Highway Capacity Ramp Analysis values and are therefore analyzed as a freeway segment.

As part of the 2019 Build and No Build analyses, the existing configuration of I-26 as a four-lane section from west of SC 27/Ridgeville Road to east of Jedburg Road was assumed.

### 4.1.1 Freeway Facility Analyses – 2019 No Build

The results of the freeway facility analyses considering 2019 No Build conditions for the 3:00 – 4:00 PM Design Hour are summarized in Table 4.2 and illustrated in Exhibit 4.1 and indicate that the study area freeway facilities are projected to operate at acceptable conditions considering 2019 No Build conditions with one exception. Worksheets documenting the freeway analyses for 2019 No Build conditions are included in Appendix D.

**Table 4.2 – Freeway Facility LOS Analysis Summary (2019 No Build)**

| I-26 Section | Eastbound | | | | | | Westbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ramp Volume (veh/hr) | Mainline Volume (veh/hr) | Average Speed (mph) | Density (pc/mi/ln) | Type | LOS | LOS | Type | Density (pc/mi/ln) | Average Speed (mph) | Mainline Volume (veh/hr) | Ramp Volume (veh/hr) |
| West of SC 27 | | 2,249 | 73.5 | 18.7 | FS | C | C | FS | 19.7 | 72.9 | 2,353 | |
| On/Off West of SC 27 | 121 | 2,249 | 60.4 | 23.8 | D | C | C | M | 22.0 | 64.3 | 2,120 | 233 |
| At SC 27 | | 2,128 | 74.0 | 17.6 | FS | B | B | FS | 17.5 | 74.0 | 2,120 | |
| On/Off East of SC 27 | 909 | 2,128 | 61.0 | 28.9 | M | D | C | D | 27.3 | 59.1 | 2,618 | 498 |
| SC 27 to Jedburg | | 3,037 | 66.9 | 27.7 | FS | D | C | FS | 22.5 | 71.0 | 2,618 | |
| On/Off West of Jedburg Road | 119 | 3,037 | 60.4 | 31.7 | D | D | C | M | 22.2 | 61.8 | 2,522 | 96 |
| Loop Off-Ramp to On-Ramp | | | | | | | C | FS | 22.4 | 68.7 | 2,522 | |
| Loop Off-Ramp | | | | | | | D | D | 30.1 | 56.9 | 3,097 | 575 |
| On/Off Ramp to Loop Off-Ramp | | 2,918 | 68.2 | 26.1 | FS | D | D | FS | 29.4 | 64.4 | 3,097 | |
| On/Off East of Jedburg Road | 615 | 2,918 | 57.4 | 31.6 | M | D | D | D | 32.6 | 58.0 | 3,336 | 239 |
| East of Jedburg Road | | 3,533 | 59.3 | 36.4 | FS | E | D | FS | 33.0 | 61.8 | 3,336 | |

For the I-26 eastbound Freeway Segment between Jedburg Road and Sheep Island Parkway the 2019 No Build traffic volume is 3,533, which is equivalent to LOS E conditions. It should be noted that SCDOT has identified this section of I-26 for widening to six lanes.

### 4.1.2 Freeway Facility Analyses – 2019 Build

The results of the freeway facility analyses considering 2019 Build conditions for the 3:00 – 4:00 PM Design Hour are summarized in Table 4.3 and illustrated in Exhibit 4.2 and indicate that the study area freeway facilities are projected to operate at acceptable conditions considering 2019 Build conditions with one exception. Worksheets documenting the freeway analyses for 2019 Build conditions are included in Appendix D.

**Table 4.3 – Freeway Facility LOS Analysis Summary (2019 Build)**

| I-26 Section | Eastbound | | | | | | Westbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ramp Volume (veh/hr) | Mainline Volume (veh/hr) | Average Speed (mph) | Density (pc/mi/ln) | Type | LOS | LOS | Type | Density (pc/mi/ln) | Average Speed (mph) | Mainline Volume (veh/hr) | Ramp Volume (veh/hr) |
| West of SC 27 | | 2,249 | 73.5 | 18.7 | FS | C | C | FS | 19.7 | 72.9 | 2,353 | |
| On/Off West of SC 27 | 105 | 2,249 | 60.5 | 23.8 | D | C | C | M | 22.1 | 63.0 | 2,256 | 97 |
| At SC 27 | | 2,144 | 73.9 | 17.7 | FS | B | C | FS | 18.8 | 73.4 | 2,256 | |
| On/Off East of SC 27 | 260 | 2,144 | 63.8 | 23.2 | M | C | C | D | 27.8 | 58.4 | 2,667 | 411 |
| SC 27 to New Interchange | | 2,404 | 72.6 | 20.2 | FS | C | C | FS | 23.1 | 70.6 | 2,667 | |
| Three-Lane On/Off West of New Interchange | | 2,404 | 75.0 | 13.1 | FS | B | B | FS | 14.5 | 74.9 | 2,667 | |
| At New Interchange | | 2,388 | 72.7 | 20.1 | FS | C | C | FS | 21.6 | 71.7 | 2,531 | |
| Four-Lane On/Off East of New Interchange | | 3,037 | 75.0 | 12.4 | FS | B | A | FS | 10.7 | 75.0 | 2,618 | |
| Three-Lane On/Off East of New Interchange | | 3,037 | 74.4 | 16.6 | FS | B | B | FS | 14.2 | 75.0 | 2,618 | |
| New Interchange to Jedburg Road | | 3,037 | 66.9 | 27.7 | FS | D | C | FS | 22.5 | 71.0 | 2,618 | |
| On/Off West of Jedburg Road | 119 | 3,037 | 59.4 | 31.7 | D | D | C | M | 22.2 | 61.8 | 2,522 | 96 |
| Loop Off-Ramp to On-Ramp | | | | | | | C | FS | 22.4 | 68.7 | 2,522 | |
| Loop Off-Ramp | | | | | | | D | D | 30.1 | 56.9 | 3,097 | 575 |
| On/Off Ramp to Loop Off-Ramp | | 2,918 | 68.2 | 26.1 | FS | D | D | FS | 29.4 | 64.4 | 3,097 | |
| On/Off East of Jedburg Road | 615 | 2,918 | 56.5 | 31.6 | M | D | D | D | 32.6 | 58.0 | 3,336 | 239 |
| East of Jedburg Road | | 3,533 | 59.3 | 36.4 | FS | E | D | FS | 33.0 | 61.8 | 3,336 | |

For the I-26 eastbound Freeway Segment between Jedburg Road and Sheep Island Parkway the 2019 Build traffic volume is the same as the 2019 No Build traffic volume of 3,533, which is equivalent to LOS E conditions. It should be noted that SCDOT has identified this section of I-26 for widening to six lanes.

### 4.1.3 Intersection Analyses – 2019 No Build and Build

As part of the 2019 Build and No Build intersection analyses, improvements to SC 27/Ridgeville Road were assumed to be in place in conjunction with construction of the initial phases of the Volvo factory to be open in 2017. The assumed improvements are listed below.

- At the SC 27/Ridgeville Road & I-26 Eastbound Ramps intersection, the addition of an exclusive eastbound right-turn lane, an exclusive southbound left-turn lane, and intersection signalization with coordinated control and protected-permitted left-turn phasing for the southbound left-turn were assumed in place.
- At the SC 27/Ridgeville Road & I-26 Westbound Ramps intersection, the addition of an exclusive westbound right-turn lane, an exclusive southbound right-turn lane, an exclusive northbound left-turn lane, and intersection signalization with coordinated control were assumed in place.
- Along SC 27/Ridgeville Road between I-26 and Lower Westvaco Road, an improved two-lane section with left-turn lanes and median separation was assumed to be in place.

No improvements to the existing SC 27/Ridgeville Road bridge over I-26 are proposed at this time. It is recommended that the SC 27/Ridgeville Road bridge over I-26 be replaced to provide for a more typical cross section, but replacement of the SC 27/Ridgeville Road bridge is not part of the I-26 & Volvo Car Drive interchange construction.

Improvements to the I-26 & Jedburg Road interchange were also assumed to be in place as part of the 2019 Build and No Build intersection analyses. These improvements are documented in the May 2010 *Sheep Island Parkway IJR/Jedburg Road IMR,* and include the widening of Jedburg Road to a four-lane, median divided section in the interchange area and the addition of an I-26 westbound-to-Jedburg Road southbound loop off-ramp.

As part of the analyses, a peak hour factor of 0.90 and truck percentage of 20% were assumed for all intersections. The truck percentage was based upon existing data collected from SCDOT ATR station P-54 along I-26 between SC 27/Ridgeville Road and Jedburg Road. To provide for a conservative analysis of intersection capacity, the 20% estimated truck percentage considered in the freeway analyses was utilized throughout the roadway network in place of exact truck percentages derived from the estimated volume of trucks at each intersection.

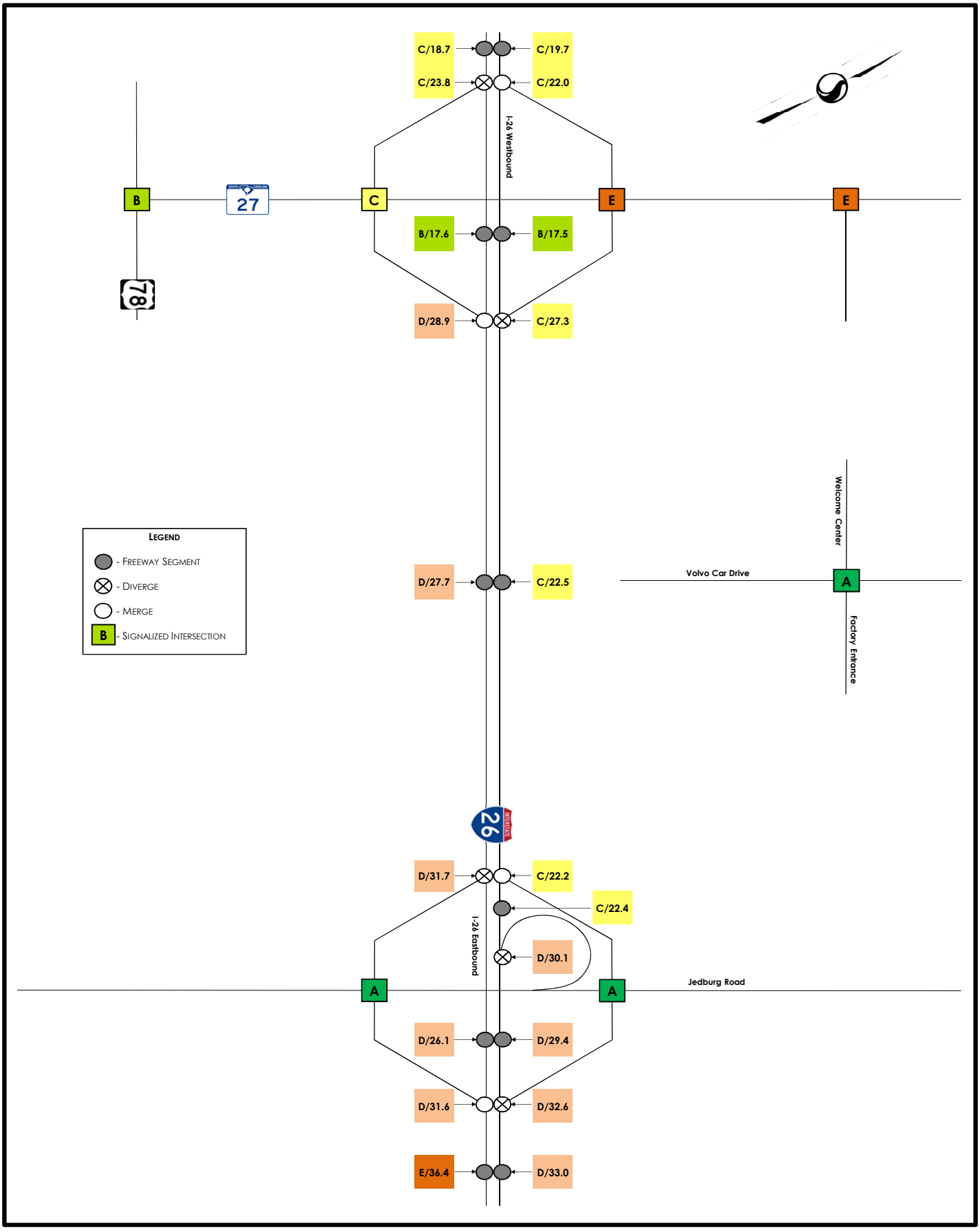
The results of the intersection analyses considering 2019 No Build and 2019 Build conditions are summarized in Table 4.4 for the 3:00 – 4:00 PM Design Hour. Worksheets documenting the intersection analyses are included in Appendix E.

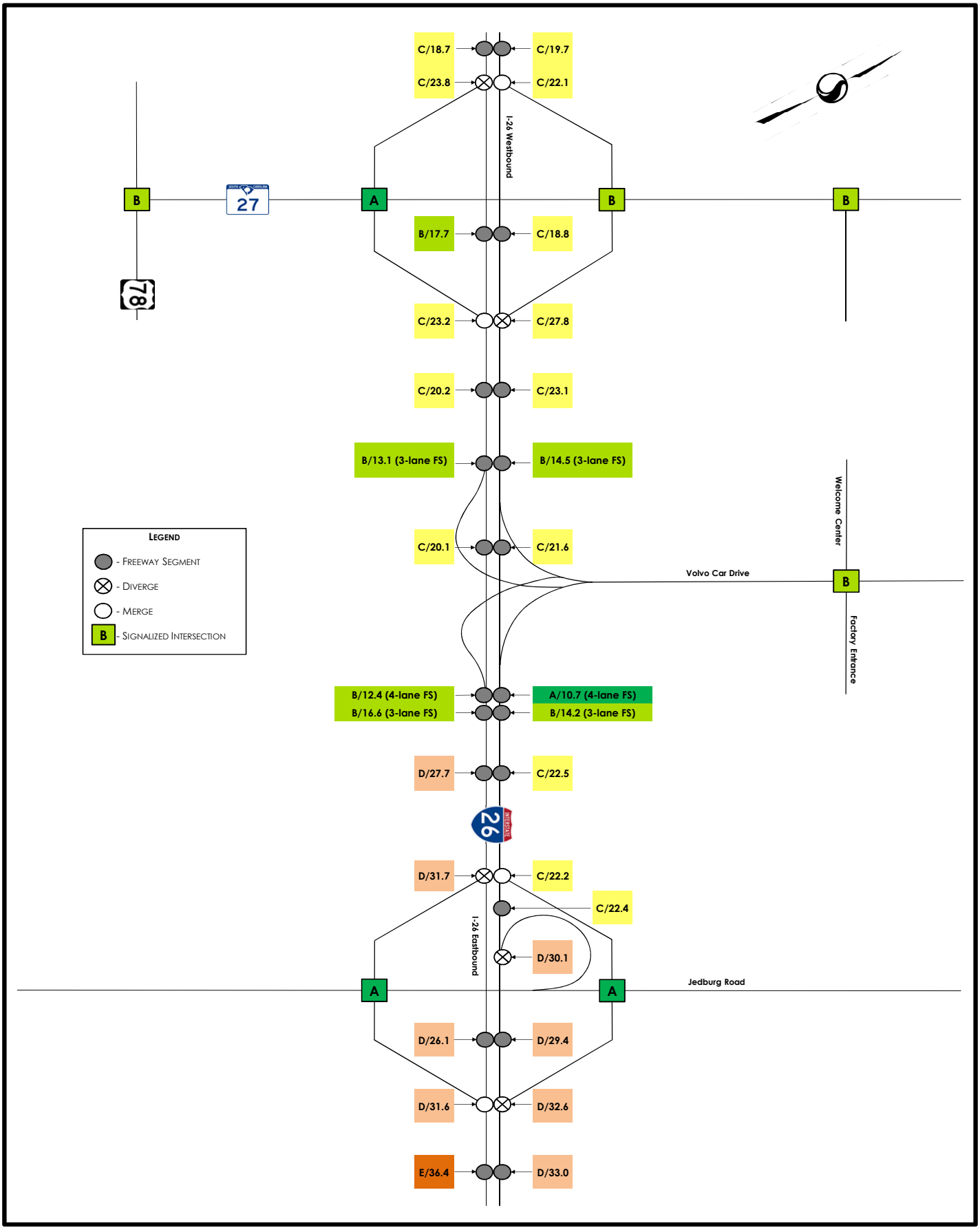
The results indicate that the study area intersections are projected to operate at acceptable conditions considering 2019 Build conditions. The results indicate that for 2019 No Build conditions, the SC 27/Ridgeville Road & I-26 Westbound Ramps intersection and SC 27/Ridgeville Road & Lower Westvaco Road intersections are projected to operate at LOS E conditions.

**Table 4.4 – Design Hour Intersection LOS Analysis Summary (2019)**

| Intersection | Level Of Service/Delay (seconds) | |
|---|---|---|
| | 2019 Build | 2019 No Build |
| SC 27 & US 78 | B/15.0 | B/15.0 |
| SC 27 & I-26 Eastbound Ramps | A/7.9 | C/27.6 |
| SC 27 & I-26 Westbound Ramps | B/18.6 | E/55.5 |
| SC 27 & Lower Westvaco Road | B/10.4 | E/60.9 |
| Volvo Car Drive & Factory Entrance | B/18.3 | A/6.1 |
| Jedburg Road & I-26 Eastbound Ramps | A/6.7 | A/6.7 |
| Jedburg Road & I-26 Westbound Ramps | A/1.8 | A/1.8 |

For 2019 No Build conditions, the LOS E conditions at the SC 27/Ridgeville Road & I-26 Westbound Ramps intersection and SC 27/Ridgeville Road & Lower Westvaco Road intersection can be attributed to all of the Volvo-related traffic being assigned to the roadway to access I-26 and the egress of Volvo factory workers during the 3:00 PM – 4:00 PM design hour.


C/18.7
C/19.7
C/23.8
C/22.0
I-26 Westbound
B
27
C
E
E
B/17.6
B/17.5
78
D/28.9
C/27.3
LEGEND
- FREEWAY SEGMENT
- DIVERGE
- MERGE
B - SIGNALIZED INTERSECTION
D/27.7
C/22.5
Welcome Center
Volvo Car Drive
A
Factory Entrance
26
D/31.7
C/22.2
C/22.4
I-26 Eastbound
D/30.1
A
A
Jedburg Road
D/26.1
D/29.4
D/31.6
D/32.6
E/36.4
D/33.0


C/18.7
C/19.7
C/23.8
C/22.1
I-26 Westbound
B
27
A
B
B
B/17.7
C/18.8
78
C/23.2
C/27.8
C/20.2
C/23.1
B/13.1 (3-lane FS)
B/14.5 (3-lane FS)
Welcome Center
LEGEND
- FREEWAY SEGMENT
- DIVERGE
- MERGE
B - SIGNALIZED INTERSECTION
C/20.1
C/21.6
Volvo Car Drive
B
Factory Entrance
B/12.4 (4-lane FS)
B/16.6 (3-lane FS)
A/10.7 (4-lane FS)
B/14.2 (3-lane FS)
D/27.7
C/22.5
26
D/31.7
C/22.2
C/22.4
I-26 Eastbound
D/30.1
A
A
Jedburg Road
D/26.1
D/29.4
D/31.6
D/32.6
E/36.4
D/33.0

## 4.2 HORIZON-YEAR 2039 ANALYSES

For 2039 Build conditions, the proposed I-26 & Volvo Car Drive interchange configuration is a three-level, three-leg directional interchange that connects I-26 and the Camp Hall Commerce Park via Volvo Car Drive. Directional ramps are proposed for all movements that will be achieved through three bridge structures. Due to the expected high attraction to/from the Charleston area, the ramps to/from Charleston are proposed to be constructed as two-lane ramps. All proposed new ramp lengths exceed Highway Capacity Ramp Analysis values and are therefore analyzed as a freeway segment.

As part of the 2039 Build and No Build analyses, the widening of I-26 to a six-lane section from west of SC 27/Ridgeville Road to east of Jedburg Road was assumed to be in place.

### 4.2.1 Freeway Facility Analyses – 2039 No Build

The results of the freeway facility analyses considering 2039 No Build conditions for the 3:00 – 4:00 PM Design Hour are summarized in Table 4.5 and Exhibit 4.3 and indicate that the study area freeway facilities are projected to operate at acceptable conditions considering 2039 No Build conditions. Worksheets documenting the freeway analyses for 2039 No Build conditions are included in Appendix F.

**Table 4.5 – Freeway Facility LOS Analysis Summary (2039 No Build)**

| I-26 Section | Eastbound | | | | | | Westbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ramp Volume (veh/hr) | Mainline Volume (veh/hr) | Average Speed (mph) | Density (pc/mi/ln) | Type | LOS | LOS | Type | Density (pc/mi/ln) | Average Speed (mph) | Mainline Volume (veh/hr) | Ramp Volume (veh/hr) |
| Two-Lane West of SC 27 | | 3,130 | 65.8 | 29.1 | FS | D | D | FS | 32.3 | 63.1 | 3,333 | |
| West of SC 27 | | 3,130 | 74.2 | 17.2 | FS | B | C | FS | 18.5 | 73.6 | 3,333 | |
| On/Off West of SC 27 | 214 | 3,130 | 65.7 | 22.5 | D | C | C | M | 20.2 | 67.0 | 2,906 | 427 |
| At SC 27 | | 2,916 | 74.6 | 15.9 | FS | B | B | FS | 15.9 | 74.6 | 2,906 | |
| On/Off East of SC 27 | 1,674 | 2,916 | 60.8 | 32.2 | M | D | C | D | 27.1 | 63.3 | 3,777 | 871 |
| SC 27 to Jedburg | | 4,590 | 66.6 | 28.1 | FS | D | C | FS | 21.4 | 71.8 | 3,777 | |
| On/Off West of Jedburg Road | 313 | 4,590 | 65.4 | 30.1 | D | D | C | M | 20.6 | 63.9 | 3,350 | 427 |
| Loop Off-Ramp to On-Ramp | | | | | | | C | FS | 19.6 | 69.7 | 3,350 | |
| Loop Off-Ramp | | | | | | | C | D | 25.3 | 61.9 | 3,976 | 626 |
| On/Off Ramp to Loop Off-Ramp | | 4,277 | 68.9 | 25.3 | FS | C | C | FS | 23.8 | 68.0 | 3,976 | |
| On/Off East of Jedburg Road | 675 | 4,277 | 62.9 | 29.2 | M | D | D | D | 28.2 | 62.3 | 4,397 | 421 |
| East of Jedburg Road | | 4,952 | 62.3 | 32.4 | FS | D | D | FS | 27.2 | 65.9 | 4,397 | |
| ***East of Jedburg Road**** | | ***3,725*** | ***65.0*** | ***21.2*** | ***FS*** | C | C | ***FS*** | ***20.0*** | ***65.0*** | ***3,505*** | |

*LOS Results from the *Sheep Island Parkway IJR/Jedburg Road IMR* for 2035 Build PM peak-hour conditions.

### 4.2.2 Freeway Facility Analyses – 2039 Build

The results of the freeway facility analyses considering 2039 Build conditions for the 3:00 – 4:00 PM Design Hour are summarized in Table 4.6 and illustrated in Exhibit 4.4 and indicate that the study area freeway facilities are projected to operate at acceptable conditions considering 2039 Build conditions. Worksheets documenting the freeway analyses for 2039 Build conditions are included in Appendix F.

**Table 4.6 – Freeway Facility LOS Analysis Summary (2039 Build)**

| I-26 Section | Eastbound | | | | | | Westbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Ramp Volume (veh/hr) | Mainline Volume (veh/hr) | Average Speed (mph) | Density (pc/mi/ln) | Type | LOS | LOS | Type | Density (pc/mi/ln) | Average Speed (mph) | Mainline Volume (veh/hr) | Ramp Volume (veh/hr) |
| Two-Lane West of SC 27 | | 3,130 | 65.8 | 29.1 | FS | D | D | FS | 32.3 | 63.1 | 3,333 | |
| West of SC 27 | | 3,130 | 74.2 | 17.2 | FS | B | C | FS | 18.5 | 73.6 | 3,333 | |
| On/Off West of SC 27 | 164 | 3,130 | 65.8 | 22.4 | D | C | B | M | 19.3 | 65.7 | 3,178 | 155 |
| At SC 27 | | 2,966 | 74.5 | 16.2 | FS | B | B | FS | 17.5 | 74.0 | 3,178 | |
| On/Off East of SC 27 | 378 | 2,966 | 66.8 | 20.8 | M | C | C | D | 26.5 | 63.1 | 3,789 | 611 |
| SC 27 to New Interchange | | 3,344 | 73.5 | 18.5 | FS | C | C | FS | 21.5 | 71.7 | 3,789 | |
| Four-Lane On/Off West of New Interchange | | 3,344 | 75.0 | 13.6 | FS | B | B | FS | 15.5 | 74.7 | 3,789 | |
| At New Interchange | | 3,294 | 73.7 | 18.2 | FS | C | C | FS | 19.7 | 72.9 | 3,517 | |
| Five-Lane On/Off East of New Interchange | | 4,590 | 74.8 | 15.0 | FS | B | B | FS | 12.3 | 75.0 | 3,777 | |
| Four-Lane On/Off East of New Interchange | | 4,590 | 73.2 | 19.2 | FS | C | B | FS | 15.4 | 74.7 | 3,777 | |
| New Interchange to Jedburg Road | | 4,590 | 66.6 | 28.1 | FS | D | C | FS | 21.4 | 71.8 | 3,777 | |
| On/Off West of Jedburg Road | 313 | 4,590 | 64.1 | 30.1 | D | D | C | M | 20.6 | 63.9 | 3,350 | 427 |
| Loop Off-Ramp to On-Ramp | | | | | | | C | FS | 19.6 | 69.7 | 3,350 | |
| Loop Off-Ramp | | | | | | | C | D | 25.3 | 61.9 | 3,976 | 626 |
| On/Off Ramp to Loop Off-Ramp | | 4,277 | 68.9 | 25.3 | FS | C | C | FS | 23.8 | 68.0 | 3,976 | |
| On/Off East of Jedburg Road | 675 | 4,277 | 61.6 | 29.2 | M | D | D | D | 28.2 | 62.3 | 4,397 | 421 |
| East of Jedburg Road | | 4,952 | 62.3 | 32.4 | FS | D | D | FS | 27.2 | 65.9 | 4,397 | |
| ***East of Jedburg Road**** | | ***3,725*** | ***65.0*** | ***21.2*** | ***FS*** | C | C | ***FS*** | ***20.0*** | ***65.0*** | ***3,505*** | |

*LOS Results from the *Sheep Island Parkway IJR/Jedburg Road IMR* for 2035 Build PM peak-hour conditions.

### 4.2.3 Intersection Analyses – 2039 No Build and Build

As part of the 2039 Build and No Build intersection analyses, improvements to SC 27/Ridgeville Road were assumed to be in place in conjunction with construction of the initial phases of the Volvo factory to be open in 2017. The assumed improvements are listed below.

- At the SC 27/Ridgeville Road & I-26 Eastbound Ramps intersection, the addition of an exclusive eastbound right-turn lane, an exclusive southbound left-turn lane, and intersection signalization with coordinated control and protected-permitted left-turn phasing for the southbound left-turn were assumed in place.
- At the SC 27/Ridgeville Road & I-26 Westbound Ramps intersection, the addition of an exclusive westbound right-turn lane, an exclusive southbound right-turn lane, an exclusive northbound left-turn lane, and intersection signalization with coordinated control were assumed in place.
- Along SC 27/Ridgeville Road between I-26 and Lower Westvaco Road, an improved two-lane section with left-turn lanes and median separation was assumed to be in place.

It should be noted that no improvements to the existing SC 27/Ridgeville Road overpass over I-26 are proposed at this time. It is recommended that the SC 27/Ridgeville Road overpass over I-26 be replaced to provide for a more typical cross section, but replacement of the SC 27/Ridgeville Road overpass is not part of the I-26 & Volvo Car Drive interchange construction.

In addition, improvements to the I-26 & Jedburg Road interchange were also assumed to be in place as part of the 2039 No Build and Build intersection analyses. These improvements are documented in the May 2010 *Sheep Island Parkway IJR/Jedburg Road IMR,* and include the widening of Jedburg Road to a four-lane, median divided section in the interchange area and the addition of an I-26 westbound-to-Jedburg Road southbound loop off-ramp.

As part of the analyses, a peak hour factor of 0.90 and truck percentage of 20% were assumed for all intersections. The truck percentage was based upon existing data collected from SCDOT ATR station P-54 along I-26 between SC 27/Ridgeville Road and Jedburg Road. To provide for a conservative analysis of intersection capacity, the 20% estimated truck percentage considered in the freeway analyses was utilized throughout the roadway network in place of exact truck percentages derived from the estimated volume of trucks at each intersection, with the exception of the Volvo Car Drive & Factory Entrance intersection analysis, which utilized truck percentages derived from the estimated truck volumes projected for the horizon year.

The results of the intersection analyses considering 2039 Build and 2039 No Build conditions are summarized in Table 4.7 for the 3:00 – 4:00 PM Design Hour. Worksheets documenting the intersection analyses are included in Appendix G.

**Table 4.7 – Design Hour Intersection LOS Analysis Summary (2039)**

| Intersection | Level Of Service/Delay (seconds) | |
|---|---|---|
| | 2039 Build | 2039 No Build |
| SC 27 & US 78 | C/23.6 | C/23.6 |
| SC 27 & I-26 Eastbound Ramps | B/10.2 | F/250.9 |
| SC 27 & I-26 Westbound Ramps | C/25.5 | F/337.4 |
| SC 27 & Lower Westvaco Road | B/14.8 | F/337.3 |
| Volvo Car Drive & Factory Entrance | C/30.9 | A/6.1 |
| Jedburg Road & I-26 Eastbound Ramps | B/12.4 | B/12.4 |
| Jedburg Road & I-26 Westbound Ramps | A/3.2 | A/3.2 |

The results indicate that the study area intersections are projected to operate at acceptable conditions considering 2039 Build conditions.

The results indicate that for 2039 No Build conditions, the three intersections along SC 27/Ridgeville Road between I-26 and Lower Westvaco Road are projected to operate at severe LOS F conditions that would represent gridlock along SC 27/Ridgeville Road. This gridlock will likely cause severe queuing on the I-26 off-ramps to SC 27/Ridgeville Road, which could potentially back-up to the I-26 mainlines in both directions. The severe failing conditions along SC 27/Ridgeville Road can be attributed to all of the Volvo-related traffic being assigned to the roadway to access I-26.

### 4.2.4 Intersection Analyses – 2039 No Build Plus Improvements

Due to the projected severe LOS F conditions that would represent gridlock along SC 27/Ridgeville Road in the 2039 No Build intersection analyses, an improvement analysis scenario for 2039 No Build conditions was evaluated considering a typical widening project for SC 27/Ridgeville Road. The improvements included widening SC 27/Ridgeville Road to a four-lane, median divided cross section; controlling access between I-26 and Lower Westvaco Road; and increasing the spacing of the I-26 ramp intersections from 700 feet to 1,320 feet. The results of the intersection analyses considering 2039 No

Build conditions plus improvements are summarized in Table 4.8 for the 3:00 – 4:00 PM Design Hour. Worksheets documenting the intersection analyses are included in Appendix G.

**Table 4.8 – Design Hour Intersection LOS Analysis Summary (2039 No Build plus Improvements)**

| Intersection | Level Of Service/Delay (seconds) | | |
|---|---|---|---|
| | 2039 Build | 2039 No Build | 2039 No Build Plus Improvements |
| SC 27 & US 78 | C/23.6 | C/23.6 | C/23.6 |
| SC 27 & I-26 Eastbound Ramps | B/10.2 | F/250.9 | F/173.2 |
| SC 27 & I-26 Westbound Ramps | C/25.5 | F/337.4 | F/146.8 |
| SC 27 & Lower Westvaco Road | B/14.8 | F/337.3 | C/34.8 |
| Volvo Car Drive & Factory Entrance | C/30.9 | A/6.1 | A/6.1 |
| Jedburg Road & I-26 Eastbound Ramps | B/12.4 | B/12.4 | B/12.4 |
| Jedburg Road & I-26 Westbound Ramps | A/3.2 | A/3.2 | A/3.2 |

The results indicate that for 2039 No Build conditions plus improvements, the typical widening improvements along SC 27/Ridgeville Road would not accommodate the 2039 No Build traffic demands. The two I-26 ramp intersections along SC 27/Ridgeville Road would still be projected to operate at severe LOS F conditions – although less severe than without improvements – that would still represent gridlock along SC 27/Ridgeville Road, which could still potentially back-up to the I-26 mainlines in both directions. The severe failing conditions along SC 27/Ridgeville Road can be attributed to all of the Volvo-related traffic being assigned to the roadway to access I-26.

The peak-direction design-hour traffic volumes along SC 27/Ridgeville Road between Lower Westvaco Road and I-26 (2,133 southbound) indicate that improvements beyond widening to a four-lane, median divided section would be required for SC 27/Ridgeville Road to operate acceptably. Furthermore, the proposed design-hour traffic demands of SC 27/Ridgeville Road traffic accessing I-26 eastbound (1,512 southbound left-turning vehicles) would require a major reconfiguration of the existing interchange beyond typical widening and turn lane improvements.

Therefore, based upon the results of the 2039 No Build conditions analysis and the 2039 No Build conditions with improvements analysis, the I-26 & Volvo Car Drive interchange is justified and needed to accommodate design-year traffic demands of the new Volvo factory and the supporting industrial

warehouse and manufacturing development of Volvo-related suppliers and manufacturers of the Camp Hall Commerce Park.

### 4.2.5 Volvo Car Drive & Factory Entrance Analyses – 2039 Build

Volvo Car Drive, a rural collector road, will begin at the point where the eastbound and westbound I-26 exit ramps converge after passing over I-26. The eastbound ramp creates the left-most lane and the westbound ramp creates the two right lanes for a total of three northbound lanes on Volvo Car Drive. Access will be fully controlled to a point 2,650 feet north of this point of convergence, where a Berkeley County project will begin, constructing the remaining 4.5 miles of Volvo Car Drive to its intersection with US 176.

The Berkeley County project will include a signalized intersection approximately 500 feet north of the access control point, and this Factory Entrance intersection will serve as the employee entrance to the Volvo factory to the east, and to the visitors' center on the west. The primary truck entrance for the Volvo factory will be located 1,000 feet north of the Factory Entrance intersection.

The Volvo Car Drive & Factory Entrance intersection will serve as the primary entrance for the Volvo Factory. The left-most lane of northbound Volvo Car Drive will terminate at the Factory Entrance intersection as a left-turn only lane into the Welcome Center while the two right lanes will continue as through lanes, with an added right-turn only lane into the Volvo Factory being developed prior to the intersection. The Volvo Car Drive & Factory Entrance intersection is also planned to be the first signalized intersection along Volvo Car Drive after entering the project site via the proposed new interchange with I-26. Therefore, intersection capacity, queueing and weaving analyses were performed to determine potential impacts that the Volvo Car Drive & Factory Entrance intersection may have on operations of the proposed new interchange during the peak ingress and peak egress time periods in horizon year 2039 Build conditions.

The peak ingress time period of the Volvo-related traffic throughout the day occurs between 5:30 AM and 6:30 AM with the ingress of the Volvo Manufacturing 1st-shift employees and was considered in the Volvo Car Drive & Factory Entrance intersection analyses.

The peak egress time period of the Volvo-related traffic throughout the day occurs between 3:00 PM and 4:00 PM with the egress of the Volvo Manufacturing 1st-shift employees and was considered in the Volvo Car Drive & Factory Entrance intersection analyses.

As part of the analyses, a peak hour factor of 0.90 was assumed for the Volvo Car Drive & Factory Entrance intersection. The analyses utilized truck percentages derived from the estimated truck volumes projected for the horizon year.

The results of the intersection capacity analyses considering 2039 Build conditions for the 5:30 – 6:30 AM peak ingress hour and 3:00 – 4:00 PM peak egress hour are summarized in Table 4.9. Worksheets documenting the intersection analyses are included in Appendix G.

**Table 4.9 – Volvo Car Drive & Factory Entrance Intersection LOS Analysis Summary (2039 Build)**

| Intersection | Level Of Service/Delay (seconds) | |
|---|---|---|
| | Peak Ingress Hour (5:30-6:30AM) | Peak Egress Hour (3:00-4:00PM) |
| Volvo Car Drive & Factory Entrance | B/17.9 | C/30.9 |

The results indicate that for horizon year 2039 Build conditions, the proposed Volvo Car Drive & Factory Entrance intersection is projected to operate at an acceptable level of service during both the 5:30 – 6:30 AM peak ingress and 3:00 – 4:00 PM peak egress time periods.

Based upon the results of the Volvo Car Drive & Factory Entrance intersection analyses, the 95$^{th}$ percentile back-of-queue for the eastbound approach was determined to be 270 feet during the 5:30 – 6:30 AM peak ingress time period and 85 feet during the 3:00 – 4:00 PM peak egress period. Worksheets documenting the queues associated with the intersection analyses are included in Appendix G.

To determine the effect of the signalized Volvo Car Drive & Factory Entrance intersection on the I-26 & Volvo Car Drive interchange, a weaving analysis was performed for the 5:30 – 6:30 AM peak ingress and 3:00 – 4:00 PM peak egress time periods. The weaving analysis considered the section of eastbound Volvo Car Drive between where the two ramps from I-26 meet to the back of the 95$^{th}$ percentile queue at the first signalized intersection.

Anticipated truck volumes were also considered an important factor in the weave analysis. Representatives of Volvo Cars reported that trucks will access the Volvo factory at a separate intersection, located 1,000 feet further north of the Factory Entrance intersection. The anticipated truck volumes coinciding with the peak ingress and peak egress hours are documented in Appendix A.

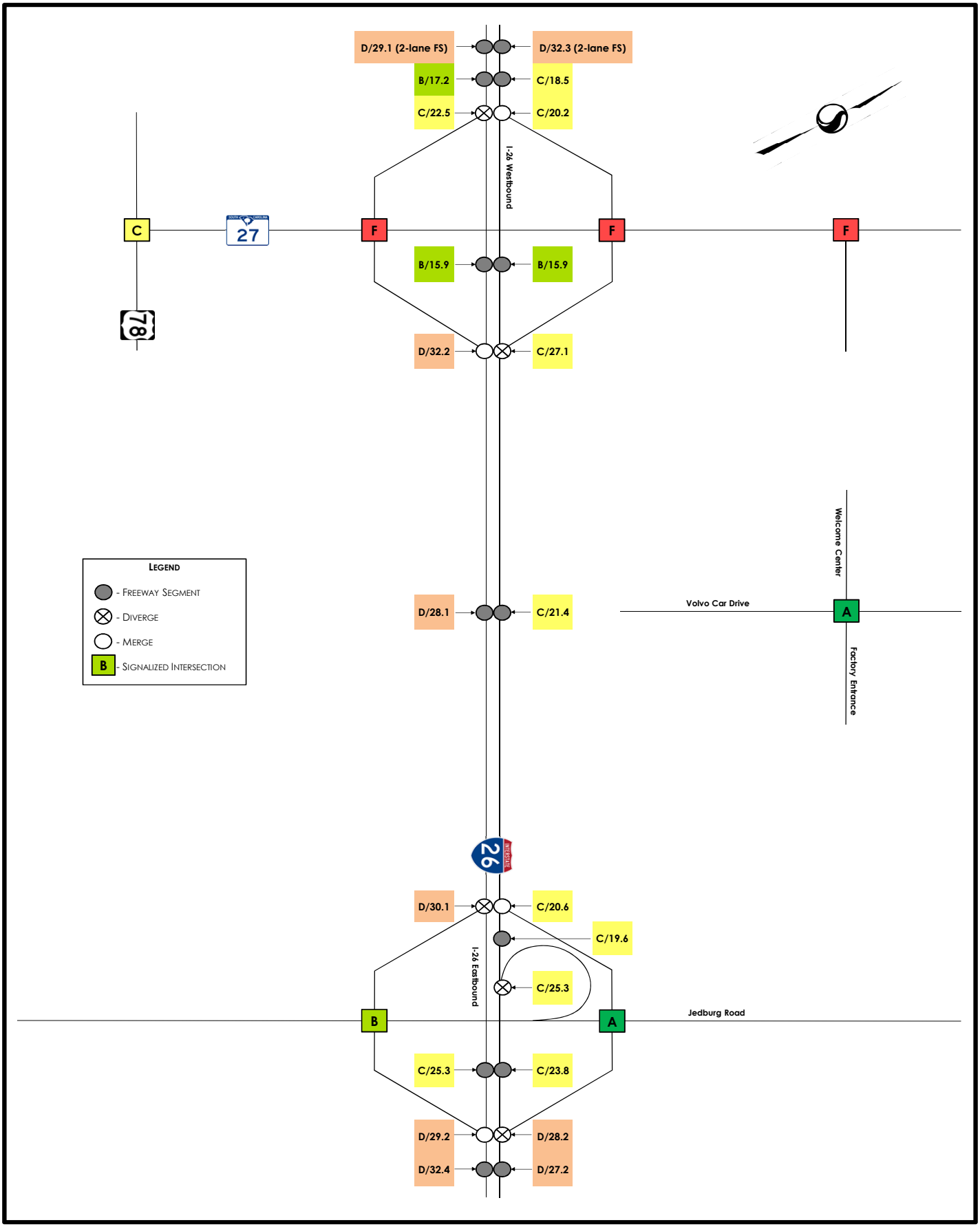
The horizon-year volume of 712 trucks per day was distributed throughout the day based upon the existing hourly distribution of trucks along I-26 as determined by data collected from SCDOT ATR station P-54 along I-26 between SC 27/Ridgeville Road and Jedburg Road. Based upon this distribution, it was determined that 4.5% of the daily truck trips would coincide with the peak ingress hour and 7.0% of the daily truck trips would coincide with the peak egress hour. The resulting truck percentages for eastbound Volvo Car Drive between the new interchange and the Factory Entrance are 2% during the peak ingress hour and 16% during the peak egress hour.

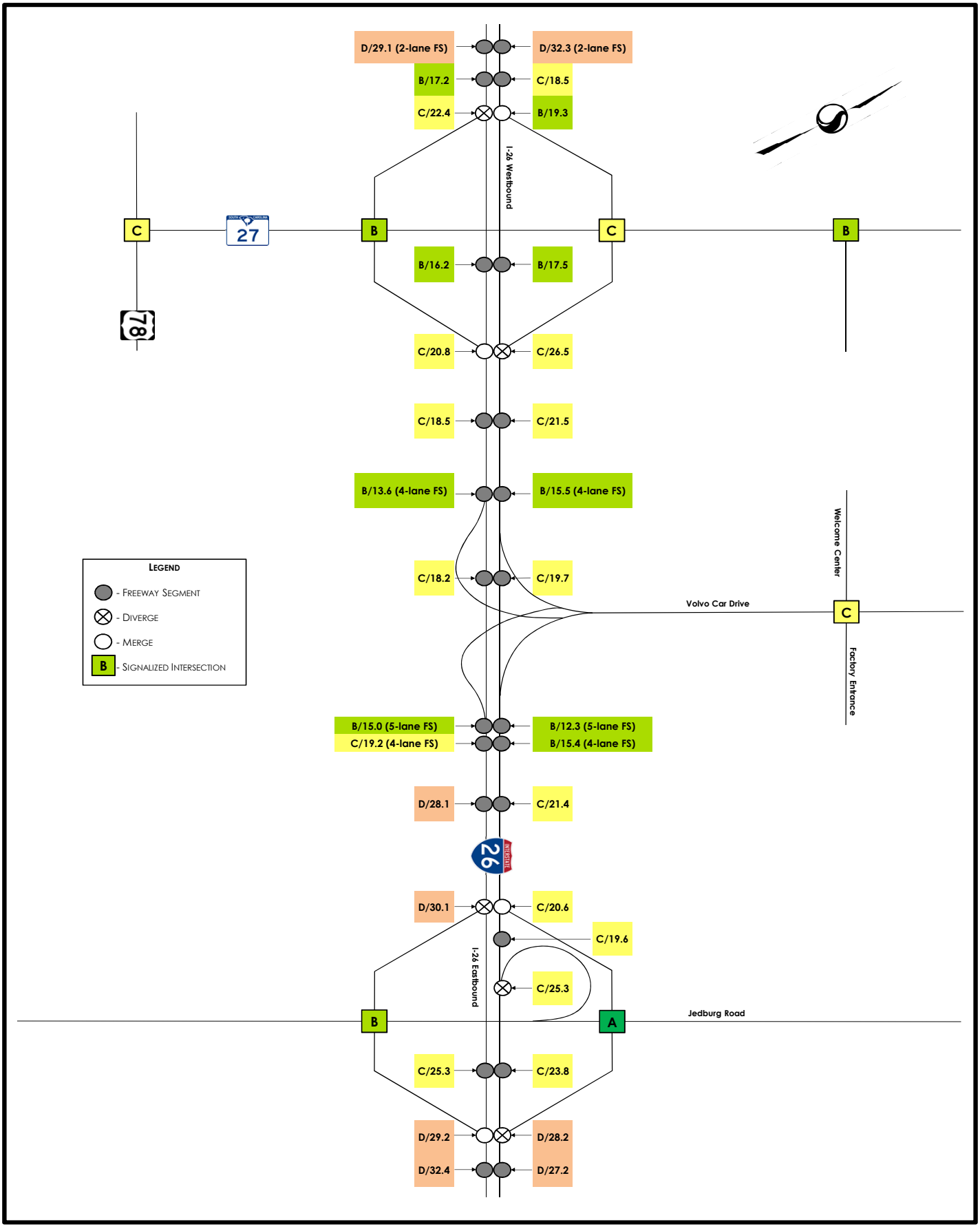
Since the analysis of the proposed interchange including freeway and ramp operations was based on twenty percent (20%) trucks, the weaving analysis was expanded to compare the capacity of Volvo Car Drive with the horizon-year ramp volumes. The results of the Volvo Car Drive weaving analysis for the 5:30 – 6:30 AM peak ingress and 3:00 – 4:00 PM peak egress time periods in the 2039 Build conditions are summarized in Table 4.10. Worksheets documenting the weaving analyses are included in Appendix H.

**Table 4.10 – Volvo Car Drive Weaving Analysis Summary (2039 Build)**

| Segment | Heavy Vehicle Percentage | LOS/Density (pc/mi/ln) | |
|---|---|---|---|
| | | Peak Ingress Hour (5:30-6:30 AM) | Peak Egress Hour (3:00-4:00 PM) |
| Volvo Car Drive between I-26 and Factory Entrance | 2% | B/15.0 | -- |
| | 16% | -- | A/3.1 |
| | 20% | B/16.5 | A/3.1 |

The results indicate that for 2039 Build conditions, the proposed roadway segment between I-26 and the Volvo Car Drive & Factory Entrance intersection is projected to operate at an acceptable level of service during both the 5:30 – 6:30 AM peak ingress and 3:00 – 4:00 PM peak egress time periods.


D/29.1 (2-lane FS)
D/32.3 (2-lane FS)
B/17.2
C/18.5
C/22.5
C/20.2
I-26 Westbound
C
27
F
F
F
B/15.9
B/15.9
78
D/32.2
C/27.1
LEGEND
- FREEWAY SEGMENT
- DIVERGE
- MERGE
B - SIGNALIZED INTERSECTION
D/28.1
C/21.4
Welcome Center
Volvo Car Drive
A
Factory Entrance
26
D/30.1
C/20.6
C/19.6
I-26 Eastbound
C/25.3
B
A
Jedburg Road
C/25.3
C/23.8
D/29.2
D/28.2
D/32.4
D/27.2


D/29.1 (2-lane FS)
D/32.3 (2-lane FS)
B/17.2
C/18.5
C/22.4
B/19.3
I-26 Westbound
C
27
B
C
B
B/16.2
B/17.5
78
C/20.8
C/26.5
C/18.5
C/21.5
B/13.6 (4-lane FS)
B/15.5 (4-lane FS)
Welcome Center
C/18.2
C/19.7
Volvo Car Drive
C
Factory Entrance
LEGEND
- FREEWAY SEGMENT
- DIVERGE
- MERGE
B - SIGNALIZED INTERSECTION
B/15.0 (5-lane FS)
C/19.2 (4-lane FS)
B/12.3 (5-lane FS)
B/15.4 (4-lane FS)
D/28.1
C/21.4
26
D/30.1
C/20.6
C/19.6
I-26 Eastbound
C/25.3
B
A
Jedburg Road
C/25.3
C/23.8
D/29.2
D/28.2
D/32.4
D/27.2

# 5.0 Eight Policy Requirements

FHWA policy requires that all requests for new or revised access should address eight policy requirements and the appropriate issues and provide the information necessary to allow the FHWA to make an informed decision considering the potential consequences of a change in access. The policy requirements are outlined in FHWA's *Interstate System Access Informational Guide* (August 2010) reference, which was used as a basis for this justification of the I-26 & Volvo Car Drive interchange.

The eight policy requirements (in bold) and responses specific to the proposed I-26 & Volvo Car Drive interchange are provided herein.

***1. The need being addressed by the request cannot be adequately satisfied by existing interchanges to the Interstate, and/or local roads and streets in the corridor can neither provide the desired access, nor can they be reasonably improved (such as access control along surface streets, improving traffic control, modifying ramp terminals and intersections, adding turn bays or lengthening storage) to satisfactorily accommodate the design-year traffic demands (23 CFR 625.2(a)).***

Car manufacturer Volvo has recently selected Berkeley County to build its first car factory in North America. The Volvo factory is expected to accommodate approximately 4,000 employees by 2040. In addition to the Volvo factory, up to 9,900,000 square feet of supporting industrial warehouse and manufacturing development is expected to be developed in the Camp Hall Commerce Park for Volvo-related suppliers and manufacturers. The proposed I-26 & Volvo Car Drive interchange project is required to accommodate the design-year traffic demands from the new Volvo factory and supporting Volvo-related suppliers and manufacturers.

Based upon the results of 2039 No Build condition, as summarized in Table 4.7, the three intersections along SC 27/Ridgeville Road between I-26 and Lower Westvaco Road are projected to operate at severe LOS F conditions that would represent gridlock along SC 27/Ridgeville Road. This gridlock will likely cause severe queuing on the I-26 off-ramps to SC 27/Ridgeville Road, which could potentially back-up to the I-26 mainlines in both directions. The severe failing conditions along SC 27/Ridgeville Road can be attributed to all of the Volvo-related traffic being assigned to the roadway to access I-26.

Therefore, an improvement analysis scenario for 2039 No Build conditions was evaluated considering a typical widening project for SC 27/Ridgeville Road. The improvements included widening SC 27/Ridgeville Road to a four-lane, median divided cross section; controlling access between I-26 and Lower Westvaco Road; and increasing the spacing of the I-26 ramp intersections from 700 feet to 1,320 feet.

The results of the improvement analysis scenario, as summarized in Table 4.8, indicate a typical widening improvement along SC 27/Ridgeville Road would not accommodate the 2039 No Build traffic demands. The two I-26 ramp intersections along SC 27/Ridgeville Road would still be projected to operate at severe LOS F conditions – although less severe than without improvements – that would still represent gridlock along SC 27/Ridgeville Road, which could still potentially back-up to the I-26 mainlines in both directions. The severe failing conditions along SC 27/Ridgeville Road can be attributed to all of the Volvo-related traffic being assigned to the roadway to access I-26.

As shown in Exhibit 3.4, the peak-direction design-hour traffic volumes along SC 27/Ridgeville Road between Lower Westvaco Road and I-26 (2,133 southbound) indicate that improvements beyond widening to a four-lane, median divided section would be required for SC 27/Ridgeville Road to operate acceptably. Furthermore, the proposed design-hour traffic demands of SC 27/Ridgeville Road traffic accessing I-26 eastbound (1,512 southbound left-turning vehicles) would require a major reconfiguration of the existing interchange beyond typical widening and turn lane improvements.

Therefore, based upon the results of the 2039 No Build conditions analysis and the 2039 No Build conditions with improvements analysis summarized in Table 4.8, the I-26 & Volvo Car Drive interchange is justified and needed to accommodate design-year traffic demands of the new Volvo factory and the supporting industrial warehouse and manufacturing development of Volvo-related suppliers and manufacturers of the Camp Hall Commerce Park.

***2. The need being addressed by the request cannot be adequately satisfied by reasonable transportation system management (such as ramp metering, mass transit, and HOV facilities), geometric design, and alternative improvements to the Interstate without the proposed change(s) in access (23 CFR 625.2(a)).***

The Volvo factory is planned to open in 2017 with approximately 1,000 manufacturing employees. The Volvo factory is projected to increase to 4,000 employees by 2040. In 2017, it is expected that approximately 1,000,000 square feet of Volvo-related suppliers and manufacturers would be operating with approximately 1,000 additional employees. By 2040, it is projected that the Volvo-related suppliers and manufacturers will total approximately 9,900,000 square feet of industrial uses in the Camp Hall Commerce Park.

As shown in Exhibit 1.2, the proposed I-26 & Volvo Car Drive interchange configuration is a three-level, three-leg directional interchange that connects I-26 and the Camp Hall Commerce Park via Volvo Car Drive. Directional ramps are proposed for all movements that will be achieved through three bridge structures. Due to the expected high attraction to/from the Charleston area, the ramps to/from Charleston are proposed to be constructed as two-lane ramps.

Due to the scope of the proposed Volvo factory and Volvo-related industrial development, Transportation System Management (TSM) improvements would not be effective in mitigating the future traffic impacts to an acceptable LOS. Charleston area transit providers CARTA and Tri-County Link currently do not serve this area of rural Berkeley County. There are currently no HOV facilities in South Carolina and SCDOT conducted a *HOV/HOT Lane Feasibility Study* in 2009 that found that HOV and HOT lanes along I-26 in the Charleston area would not be cost feasible.

The IJR traffic analyses consider shifting of employees and staggered work hours, as described in sections 3.2.2 and 3.3.2 and documented in Appendix A, to minimize and spread out the peak travel demands of the Volvo factory and Volvo-related industrial development; however, the I-26 & Volvo Car Drive interchange is still required to accommodate the design-year traffic demand. Other travel demand management options such as carpooling were considered, but it was noted that at the BMW factory in Greer, South Carolina, employee carpooling has been difficult to achieve due to changing shifts and the staggered schedules that are currently in use.

Without the proposed I-26 & Volvo Car Drive interchange, the peak-direction design-hour traffic volumes shown in Exhibit 3.4 along SC 27/Ridgeville Road between Lower Westvaco Road and I-26 (2,133 southbound) indicate that improvements beyond widening to a four-lane, median divided section would be required for SC 27/Ridgeville Road to operate acceptably. Furthermore, the proposed design-hour traffic demands of SC 27/Ridgeville Road traffic accessing I-26 eastbound (1,512 southbound left-turning vehicles) would require a major reconfiguration of the existing interchange beyond typical widening and turn lane improvements.

Therefore, the I-26 & Volvo Car Drive interchange is justified and needed to accommodate design-year traffic demands of the new Volvo factory and the supporting industrial warehouse and manufacturing development of Volvo-related suppliers and manufacturers of the Camp Hall Commerce Park.

It should be noted that the proposed two points of access to I-26 through Volvo Car Drive and SC 27/Ridgeville Road for the Volvo factory and Volvo-related industrial development would be equal to the access of the existing BMW factory in Greer, South Carolina.

***3. An operational and safety analysis has concluded that the proposed change in access does not have a significant adverse impact on the safety and operation of the Interstate facility (which includes mainline lanes, existing, new, or modified ramps, ramp intersections with crossroad) or on the local street network based on both the current and the planned future traffic projections. The analysis shall, particularly in urbanized areas, include at least the first adjacent existing or proposed interchange on either side of the proposed change in access (23 CFR 625.2(a), 655.603(d) and 771.111(f)). The crossroads and the local street network, to at least the first major intersection on either side of the proposed change in access, shall be included in this analysis to the extent necessary to fully evaluate the safety and operational impacts that the proposed change in access and other transportation improvements may have on the local street network (23 CFR 625.2(a) and 655.603(d)). Requests for a proposed change in access must include a description and assessment of the impacts and ability of the proposed changes to safely and efficiently collect, distribute and accommodate traffic on the Interstate facility, ramps, intersection of ramps with crossroad, and local street network (23 CFR 625.2(a) and 655.603(d)). Each request must also include a conceptual plan of the type and location of the signs proposed to support each design alternative (23 U.S.C. 109(d) and 23 CFR 655.603(d)).***

Using the projected opening-year 2019 and horizon-year 2039 traffic volumes for No Build and Build conditions of the proposed I-26 & Volvo Car Drive interchange, capacity analyses were conducted for the study area freeway facilities and intersections using the *Highway Capacity Software 2010* and the Transportation Research Board's *Highway Capacity Manual 2010* methodologies of the *Synchro* Version 9 software.

Based upon the results of the 2039 Build analysis for the 3:00 – 4:00 PM Design Hour, the operations of the proposed I-26 & Volvo Car Drive interchange and the I-26 freeway between SC 27/Ridgeville Road and Jedburg Road will be improved from the 2039 No Build scenario. As shown in Table 4.6 and Exhibit 4.4, the results of the freeway facility analyses considering 2039 Build conditions indicate that the study area freeway facilities are projected to operate at acceptable conditions considering 2039 Build conditions.

The adjacent interchanges of I-26 & SC 27/Ridgeville Road and I-26 & Jedburg Road were considered in the project study area. Improvements to the I-26 & Jedburg Road interchange, as documented in the May 2010 *Sheep Island Parkway IJR/Jedburg Road IMR*, were assumed to be in place as part of the 2019 and 2039 analyses. The improvements include the widening of Jedburg Road to a four-lane, median divided section in the interchange area and the addition of an I-26 westbound-to-Jedburg Road southbound loop off-ramp. For analysis purposes, the IMR year 2035 traffic volumes, assumptions, and results for the I-26

& Jedburg Road interchange were considered as a base for the development of the 2039 Build and No Build analyses.

Based upon the results of the 2039 Build analysis at the study intersections along SC 27/Ridgeville Road and Jedburg Road summarized in Table 4.7, the results indicate that the study intersections are projected to operate at acceptable conditions considering 2039 Build conditions.

A figure illustrating a concept of the proposed I-26 & Volvo Car Drive interchange is shown in Exhibit 1.2 and a figure illustrating a conceptual guide sign plan for the proposed interchange is shown in Exhibit 1.3.

***4. The proposed access connects to a public road only and will provide for all traffic movements. Less than "full interchanges" may be considered on a case-by-case basis for applications requiring special access for managed lanes (e.g., transit, HOVs, HOT lanes) or park and ride lots. The proposed access will be designed to meet or exceed current standards (23 CFR 625.2(a), 625.4(a)(2), and 655.603(d)).***

As illustrated in Exhibit 1.2, the proposed I-26 & Volvo Car Drive interchange configuration is a three-level, three-leg directional interchange that connects I-26 and the Camp Hall Commerce Park via Volvo Car Drive. Volvo Car Drive is proposed to be a new Berkeley County roadway from the I-26 limited access right of way to US 176.

Directional ramps are proposed at the new interchange for all movements that will be achieved through three bridge structures. Due to the expected high attraction to/from the Charleston area, the ramps to/from Charleston are proposed to be constructed as two-lane ramps.

The new interchange will provide the four basic movements to/from I-26 in both the eastbound and westbound directions and will be designed to meet the current standards.

***5. The proposal considers and is consistent with local and regional land use and transportation plans. Prior to receiving final approval, all requests for new or revised access must be included in an adopted Metropolitan Transportation Plan, in the adopted Statewide or Metropolitan Transportation Improvement Program (STIP or TIP), and the Congestion Management Process within transportation management areas, as appropriate, and as specified in 23 CFR part 450, and the transportation conformity requirements of 40 CFR parts 51 and 93.***

The proposed I-26 & Volvo Car Drive interchange project is currently included in the South Carolina Statewide Transportation Improvement Program as amended January 21, 2016.

The project is located within the rural planning area served by the Berkeley-Charleston-Dorchester Council of Governments (BCDCOG). Overall, the I-26 & Volvo Car Drive interchange project is a major project in Berkeley County that supports the region's and state's economic development goals. The I-26 & Volvo Car Drive interchange project is incorporated in the current South Carolina Statewide Transportation Improvement Program (STIP), which is the State's six-year transportation improvement program for all projects or program areas receiving federal funding. The STIP covers all federally funded improvements for which funding has been approved and that are expected to be undertaken during the upcoming six-year period. The amended STIP revision was published on January 21, 2016 with $35M beginning in FY2016 and intended only for these improvements.

***6. In corridors where the potential exists for future multiple interchange additions, a comprehensive corridor or network study must accompany all requests for new or revised access with recommendations that address all of the proposed and desired access changes within the context of a longer-range system or network plan (23 U.S.C. 109(d), 23 CFR 625.2(a), 655.603(d), and 771.111).***

The proposed I-26 & Volvo Car Drive project is located approximately two miles from SC 27/Ridgeville Road (Exit 187) and approximately five miles from Jedburg Road (Exit 194). No other new interchanges are currently planned along I-26 between the proposed Volvo Car Drive and Jedburg Road.

A new interchange at Sheep Island Parkway (new Exit 197) is planned to be constructed approximately three miles south of Jedburg Road (Exit 194). Improvements to the I-26 & Sheep Island Parkway and I-26 & Jedburg Road interchanges are documented in the May 2010 *Sheep Island Parkway IJR/Jedburg Road IMR*.

It should be noted that SCDOT is currently advertising for an I-26 Corridor Management Plan project that will evaluate existing and future projection congestion along the corridor from SC 27/Ridgeville Road (Exit 187) east to the Charleston peninsula at Meeting Street/US 17 South (Exit 221).

***7. When a new or revised access point is due to a new, expanded, or substantial change in current or planned future development or land use, requests must demonstrate appropriate coordination has occurred between the development and any proposed transportation system improvements (23 CFR 625.2(a) and 655.603(d)). The request must describe the commitments agreed upon to assure adequate collection and dispersion of the traffic resulting from the development with the adjoining local street network and Interstate access point (23 CFR 625.2(a) and 655.603(d)).***

Numerous coordination meetings have been held to discuss the development of the Camp Hall Commerce Park for the Volvo factory and Volvo-related industrial development. The meetings' attendees have included USACE, FHWA, SCDOT, SC Department of Commerce, and project consultant staffs.

Several new roadways are planned to support the proposed development of the Camp Hall Commerce Park for Volvo. Volvo Car Drive is planned as the primary north/south roadway connection between I-26 and US 176 providing access to the development. There are two east/west roadway connections between SC 27/Ridgeville Road and Volvo Car Drive planned to provide additional access which are currently named Westvaco Road and Lower Westvaco Road.

The adjacent interchanges of I-26 & SC 27/Ridgeville Road and I-26 & Jedburg Road were considered in the project study area. Improvements to the I-26 & Jedburg Road interchange, as documented in the May 2010 *Sheep Island Parkway IJR/Jedburg Road IMR*, were assumed to be in place as part of the 2019 and 2039 analyses. The improvements include the widening of Jedburg Road to a four-lane, median divided section in the interchange area and the addition of an I-26 westbound-to-Jedburg Road southbound loop off-ramp. For analysis purposes, the IMR year 2035 traffic volumes, assumptions, and results for the I-26 & Jedburg Road interchange were considered as a base for the development of the 2039 Build and No Build analyses.

***8. The proposal can be expected to be included as an alternative in the required environmental evaluation, review and processing. The proposal should include supporting information and current status of the environmental processing (23 CFR 771.111).***

The proposed I-26 & Volvo Car Drive interchange in Berkeley County, South Carolina has been included as part of the National Environmental Policy Act (NEPA) permitting process for the Camp Hall Commerce Park. FHWA was a contributing agency to the NEPA document prepared by the U.S. Army Corps of Engineers for the permit issued for the Camp Hall Commerce Park site, which included the proposed new interchange area. FHWA will utilize the information prepared and included as a part of the U.S. Corps of Engineers NEPA document to prepare a Finding of No Significant Impact (FONSI) for their file on the interchange project.

# Appendix A

# Trip Generation & Shift Assumption Worksheets

# I-26 & Volvo Car Drive IJR

**Shift Summary Assumptions**

2019 Buildout

**TRIP GENERATION ASSUMPTIONS**

| Use | Size | AM Entering | AM Exiting | PM Entering | PM Exiting | Notes |
|---|---|---|---|---|---|---|
| Volvo Office | 200 emps | 105 | 15 | 25 | 110 | ITE LUC 710 |
| Volvo Manufacturing | 1,000 emps | 900 | 100 | 100 | 900 | 1.0 emps/veh, 90/10 directional split |
| Camp Hall Warehousing | 400 emps | 145 | 55 | 80 | 150 | ITE LUC 150 |
| Camp Hall Manufacturing | 600 emps | 180 | 70 | 105 | 135 | ITE LUC 140 |
| Total Camp Hall | 1,000 emps | 325 | 125 | 185 | 285 | Warehousing + Manufacturing |
| Construction | 500 emps | 450 | 50 | 50 | 450 | 1.0 emps/veh, 90/10 directional split |

**Volvo Office (assume 10% during Volvo peaks)**

Entering Peak: 5:30 AM to 6:30 AM
Exiting Peak: 3:00 PM to 4:00 PM

| AM Entering | AM Exiting | PM Entering | PM Exiting |
|---|---|---|---|
| 11 | 2 | 3 | 11 |

**Volvo Manufacturing (One Shift)**

Entering Peak: 5:30 AM to 6:30 AM
Exiting Peak: 3:00 PM to 4:00 PM

| AM Entering | AM Exiting | PM Entering | PM Exiting |
|---|---|---|---|
| 900 | 100 | 100 | 900 |

**TOTAL**

Entering Peak: 5:30 AM to 6:30 AM
Exiting Peak: 3:00 PM to 4:00 PM

| AM Entering | AM Exiting | PM Entering | PM Exiting |
|---|---|---|---|
| 1,172 | 153 | 169 | 1,162 |

**Total Camp Hall (assume 25% during Volvo peaks)**

Entering Peak: 5:30 AM to 6:30 AM
Exiting Peak: 3:00 PM to 4:00 PM

| AM Entering | AM Exiting | PM Entering | PM Exiting |
|---|---|---|---|
| 81 | 31 | 46 | 71 |

**Construction (assume 40% during Volvo peaks)**

Entering Peak: 5:30 AM to 6:30 AM
Exiting Peak: 3:00 PM to 4:00 PM

| AM Entering | AM Exiting | PM Entering | PM Exiting |
|---|---|---|---|
| 180 | 20 | 20 | 180 |

**ASSUMPTIONS**

> 6:30 AM starting time for Volvo based upon information from Volvo (same as Boeing 1st shift starting time).

# I-26 & Volvo Car Drive IJR

**Shift Summary Assumptions**

2039 Buildout

**TRIP GENERATION ASSUMPTIONS**

| Use | Size | AM Entering | AM Exiting | PM Entering | PM Exiting | Notes |
|---|---|---|---|---|---|---|
| Volvo Office | 500 emps | 240 | 31 | 41 | 210 | ITE LUC 710 |
| Volvo Manufacturing | 4,000 emps | 3,600 | 400 | 400 | 3,600 | 1.0 emps/veh, 90/10 directional split |
| Volvo Trucks | 712 daily trips | 32 | 32 | 50 | 50 | Daily rate provided by Volvo |
| Camp Hall Warehousing | 3,900 emps | 1,080 | 420 | 620 | 1,150 | ITE LUC 150 |
| Camp Hall Manufacturing | 6,000 emps | 1,275 | 470 | 630 | 800 | ITE LUC 140 |
| Camp Hall Trucks | 10% of employee trips | 235 | 90 | 125 | 195 | Additional 10% |
| Total Camp Hall | 9,900 emps | 2,590 | 980 | 1,375 | 2,145 | Warehousing + Manufacturing + Trucks |

**PROPOSED SHIFT ASSUMPTIONS**

**Volvo Office**

Operations: 8:30 AM to 5:00 PM
Entering Peak: 7:30 AM to 8:30 AM
Exiting Peak: 5:00 PM to 6:00 PM

| AM Entering | AM Exiting | PM Entering | PM Exiting |
|---|---|---|---|
| 240 | 31 | 41 | 210 |

**Volvo Manufacturing - 1st Shift**

Assume: 60% of total workers
Operations: 6:30 AM to 3:00 PM
Entering Peak: 5:30 AM to 6:30 AM
Exiting Peak: 3:00 PM to 4:00 PM

| AM Entering | AM Exiting | PM Entering | PM Exiting |
|---|---|---|---|
| 2,160 | 240 | 240 | 2,160 |

**Volvo Manufacturing - 2nd Shift**

Assume: 30% of total workers
Operations: 2:30 PM to 11:00 PM
Entering Peak: 1:30 PM to 2:30 PM
Exiting Peak: 11:00 PM to 12:00 AM

| AM Entering | AM Exiting | PM Entering | PM Exiting |
|---|---|---|---|
| 1,080 | 120 | 120 | 1,080 |

**Volvo Manufacturing - 3rd Shift**

Assume: 10% of total workers
Operations: 10:30 PM to 7:00 AM
Entering Peak: 9:30 PM to 10:30 PM
Exiting Peak: 7:00 AM to 8:00 AM

| AM Entering | AM Exiting | PM Entering | PM Exiting |
|---|---|---|---|
| 360 | 40 | 40 | 360 |

**Volvo Trucks**

| Basis | Value |
|---|---|
| Employees | 4,000 |
| Production (Cars Produced/Year) | 300,000 |
| Trucks/Day | 712 |

Assume: 50/50 directional split
4.5% during 5:30 AM to 6:30 AM
7.0% during 3:00 PM to 4:00 PM

| AM Entering | AM Exiting | PM Entering | PM Exiting |
|---|---|---|---|
| 32 | 32 | 50 | 50 |

**Total Camp Hall - 1/3 Office Operations**

Assume: Office Operations
Operations: 8:30 AM to 5:00 PM
Entering Peak: 7:30 AM to 8:30 AM
Exiting Peak: 5:00 PM to 6:00 PM

| AM Entering | AM Exiting | PM Entering | PM Exiting |
|---|---|---|---|
| 863 | 327 | 458 | 715 |

**Total Camp Hall - 2/3 Manufacturing - 1st Shift**

Assume: 60% of total workers
Operations: 7:30 AM to 4:00 PM
Entering Peak: 6:30 AM to 7:30 AM
Exiting Peak: 4:00 PM to 5:00 PM

| AM Entering | AM Exiting | PM Entering | PM Exiting |
|---|---|---|---|
| 1,036 | 392 | 550 | 858 |

**Total Camp Hall - 2/3 Manufacturing - 2nd Shift**

Assume: 30% of total workers
Operations: 3:30 PM to 12:00 AM
Entering Peak: 2:30 PM to 3:30 PM
Exiting Peak: 12:00 AM to 1:00 AM

| AM Entering | AM Exiting | PM Entering | PM Exiting |
|---|---|---|---|
| 518 | 196 | 275 | 429 |

**Total Camp Hall - 2/3 Manufacturing - 3rd Shift**

Assume: 10% of total workers
Operations: 11:30 PM to 8:00 AM
Entering Peak: 10:30 PM to 11:30 PM
Exiting Peak: 8:00 AM to 9:00 AM

| AM Entering | AM Exiting | PM Entering | PM Exiting |
|---|---|---|---|
| 173 | 65 | 92 | 143 |

**Volvo Trucks Hourly Distribution**

| Hour Beginning At | % | Hour Beginning At | % |
|---|---|---|---|
| 12:00 AM | 1.0% | 12:00 PM | 7.0% |
| 1:00 AM | 1.0% | 1:00 PM | 7.0% |
| 2:00 AM | 1.0% | 2:00 PM | 7.0% |
| 3:00 AM | 2.0% | 3:00 PM | 7.0% |
| 4:00 AM | 3.0% | 4:00 PM | 6.0% |
| 5:00 AM | 4.0% | 5:00 PM | 5.0% |
| 6:00 AM | 5.0% | 6:00 PM | 4.0% |
| 7:00 AM | 5.0% | 7:00 PM | 3.0% |
| 8:00 AM | 5.0% | 8:00 PM | 3.0% |
| 9:00 AM | 6.0% | 9:00 PM | 2.0% |
| 10:00 AM | 6.0% | 10:00 PM | 2.0% |
| 11:00 AM | 7.0% | 11:00 PM | 1.0% |

**ASSUMPTIONS**

> 6:30 AM starting time for Volvo 1st shift based upon information from Volvo (same as Boeing 1st shift starting time).

> 60%/30%/10% shift split percentage based upon existing shifts of other large developments in the area.

> Assume Volvo Truck trips follow the hourly distribution of heavy vehicles on I-26 based on permanent count station information.

> Assume 2/3 of the total Camp Hall trips are manufacturing-related and use shifts staggered one hour from the Volvo shifts and 1/3 of the total Camp Hall trips are office-related and follow the Volvo Office operations (this is a similar split as other large-scale developments in the area).

> Assume Camp Hall Truck trips follow the same assumptions as the employee trips

**I-26 & Volvo Car Drive IJR**

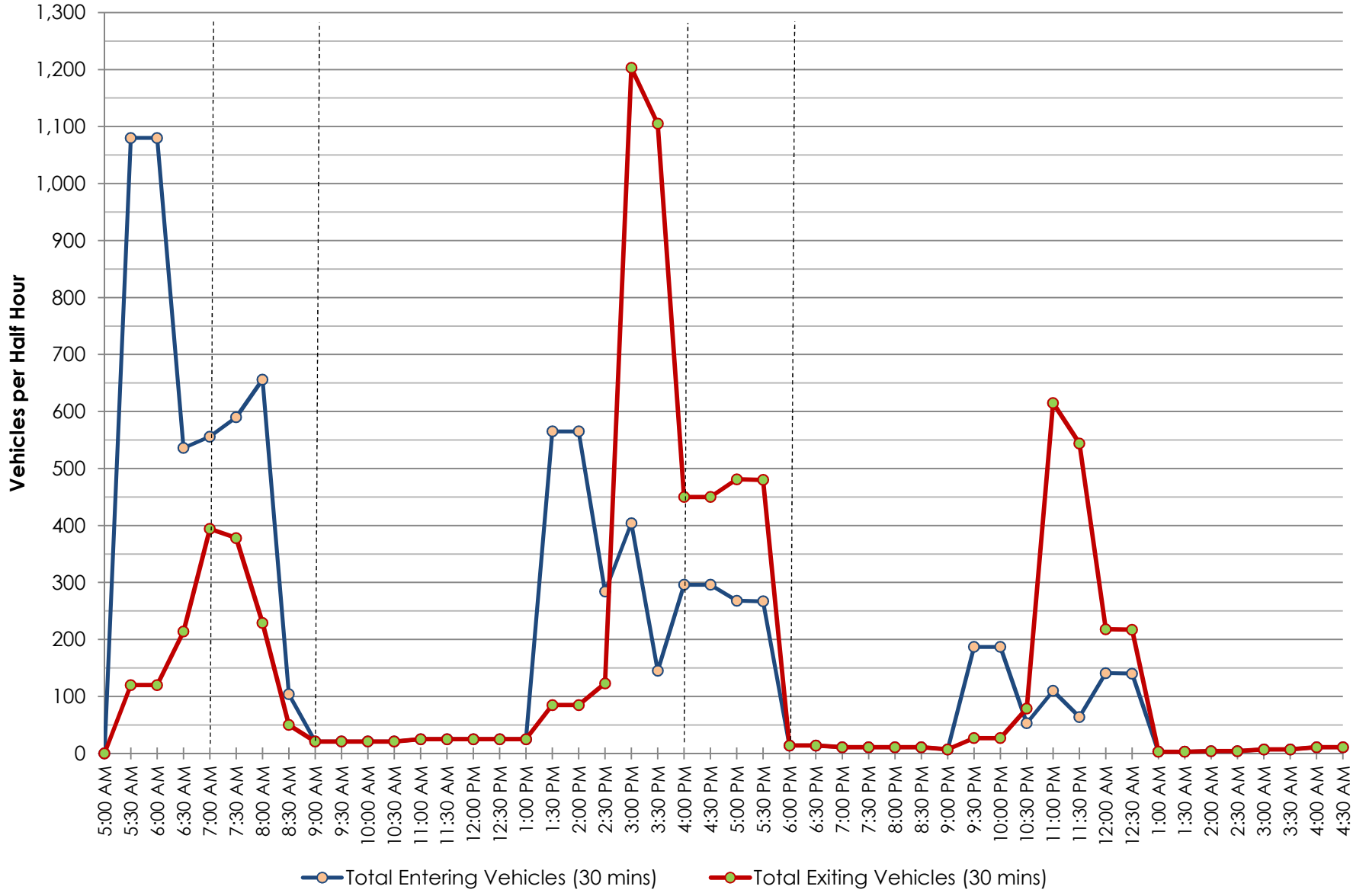
**Hourly Distribution Assumptions**

2039 Buildout

| 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 Mnfctrng - 1st Shift | | Total Camp Hall - 2/3 Mnfctrng - 2nd Shift | | Total Camp Hall - 2/3 Mnfctrng - 3rd Shift | | Total Entering Vehicles (30 mins) | Total Exiting Vehicles (30 mins) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Enter | Exit | Enter | Exit | Enter | Exit | Enter | Exit | Enter | Exit | Enter | Exit | Enter | Exit | Enter | Exit | Enter | Exit | | |
| 5:00 AM | | | | | | | | | 14 | 14 | | | | | | | | | 0 | 0 |
| 5:30 AM | | | 1,080 | 120 | | | | | 14 | 14 | | | | | | | | | **1,080** | 120 |
| 6:00 AM | | | 1,080 | 120 | | | | | 18 | 18 | | | | | | | | | **1,080** | 120 |
| 6:30 AM | | | | | | | | | 18 | 18 | | | 518 | 196 | | | | | 536 | 214 |
| 7:00 AM | | | | | | | 20 | 180 | 18 | 18 | | | 518 | 196 | | | | | 556 | 394 |
| 7:30 AM | 120 | 16 | | | | | 20 | 180 | 18 | 18 | 432 | 164 | | | | | | | 590 | 378 |
| 8:00 AM | 120 | 15 | | | | | | | 18 | 18 | 431 | 163 | | | | | 87 | 33 | 656 | 229 |
| 8:30 AM | | | | | | | | | 18 | 18 | | | | | | | 86 | 32 | 104 | 50 |
| 9:00 AM | | | | | | | | | 21 | 21 | | | | | | | | | 21 | 21 |
| 9:30 AM | | | | | | | | | 21 | 21 | | | | | | | | | 21 | 21 |
| 10:00 AM | | | | | | | | | 21 | 21 | | | | | | | | | 21 | 21 |
| 10:30 AM | | | | | | | | | 21 | 21 | | | | | | | | | 21 | 21 |
| 11:00 AM | | | | | | | | | 25 | 25 | | | | | | | | | 25 | 25 |
| 11:30 AM | | | | | | | | | 25 | 25 | | | | | | | | | 25 | 25 |
| 12:00 PM | | | | | | | | | 25 | 25 | | | | | | | | | 25 | 25 |
| 12:30 PM | | | | | | | | | 25 | 25 | | | | | | | | | 25 | 25 |
| 1:00 PM | | | | | | | | | 25 | 25 | | | | | | | | | 25 | 25 |
| 1:30 PM | | | | | 540 | 60 | | | 25 | 25 | | | | | | | | | 565 | 85 |
| 2:00 PM | | | | | 540 | 60 | | | 25 | 25 | | | | | | | | | 565 | 85 |
| 2:30 PM | | | | | | | | | 25 | 25 | | | | | 259 | 98 | | | 284 | 123 |
| 3:00 PM | | | 120 | 1,080 | | | | | 25 | 25 | | | | | 259 | 98 | | | 404 | **1,203** |
| 3:30 PM | | | 120 | 1,080 | | | | | 25 | 25 | | | | | | | | | 145 | **1,105** |
| 4:00 PM | | | | | | | | | 21 | 21 | | | 275 | 429 | | | | | 296 | 450 |
| 4:30 PM | | | | | | | | | 21 | 21 | | | 275 | 429 | | | | | 296 | 450 |
| 5:00 PM | 21 | 105 | | | | | | | 18 | 18 | 229 | 358 | | | | | | | 268 | 481 |
| 5:30 PM | 20 | 105 | | | | | | | 18 | 18 | 229 | 357 | | | | | | | 267 | 480 |
| 6:00 PM | | | | | | | | | 14 | 14 | | | | | | | | | 14 | 14 |
| 6:30 PM | | | | | | | | | 14 | 14 | | | | | | | | | 14 | 14 |
| 7:00 PM | | | | | | | | | 11 | 11 | | | | | | | | | 11 | 11 |
| 7:30 PM | | | | | | | | | 11 | 11 | | | | | | | | | 11 | 11 |
| 8:00 PM | | | | | | | | | 11 | 11 | | | | | | | | | 11 | 11 |
| 8:30 PM | | | | | | | | | 11 | 11 | | | | | | | | | 11 | 11 |
| 9:00 PM | | | | | | | | | 7 | 7 | | | | | | | | | 7 | 7 |
| 9:30 PM | | | | | | | 180 | 20 | 7 | 7 | | | | | | | | | 187 | 27 |
| 10:00 PM | | | | | | | 180 | 20 | 7 | 7 | | | | | | | | | 187 | 27 |
| 10:30 PM | | | | | | | | | 7 | 7 | | | | | | | 46 | 72 | 53 | 79 |
| 11:00 PM | | | | | 60 | 540 | | | 4 | 4 | | | | | | | 46 | 71 | 110 | 615 |
| 11:30 PM | | | | | 60 | 540 | | | 4 | 4 | | | | | | | | | 64 | 544 |
| 12:00 AM | | | | | | | | | 3 | 3 | | | | | 138 | 215 | | | 141 | 218 |
| 12:30 AM | | | | | | | | | 3 | 3 | | | | | 137 | 214 | | | 140 | 217 |
| 1:00 AM | | | | | | | | | 3 | 3 | | | | | | | | | 3 | 3 |
| 1:30 AM | | | | | | | | | 3 | 3 | | | | | | | | | 3 | 3 |
| 2:00 AM | | | | | | | | | 4 | 4 | | | | | | | | | 4 | 4 |
| 2:30 AM | | | | | | | | | 4 | 4 | | | | | | | | | 4 | 4 |
| 3:00 AM | | | | | | | | | 7 | 7 | | | | | | | | | 7 | 7 |
| 3:30 AM | | | | | | | | | 7 | 7 | | | | | | | | | 7 | 7 |
| 4:00 AM | | | | | | | | | 11 | 11 | | | | | | | | | 11 | 11 |
| 4:30 AM | | | | | | | | | 11 | 11 | | | | | | | | | 11 | 11 |

# Volvo-Related Traffic Half-Hourly Distribution

## 2039 Buildout



# Appendix B

# 2019 Traffic Volume Development Worksheets

# INTERSECTION TRAFFIC VOLUME DEVELOPMENT

## SC 27/Ridgeville Road & US 78

**TRAFFIC CONTROL: Signalized**

**DATE COUNTED: May 7, 2015**

| DESIGN PEAK HOUR (3:00-4:00 PM) | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **2015 TRAFFIC VOLUMES** | **87** | **139** | | | **227** | **129** | | | | **150** | | **150** |
| Years To Buildout (2019) | 4 | 4 | | | 4 | 4 | | | | 4 | | 4 |
| Yearly Growth Rate | 2.0% | 2.0% | | | 2.0% | 2.0% | | | | 2.0% | | 2.0% |
| Background Traffic Growth | 7 | 11 | | | 18 | 10 | | | | 12 | | 12 |
| Volvo Traffic | 3 | | | | | 4 | | | | 36 | | 27 |
| Camp Hall Traffic | 1 | | | | | 2 | | | | 3 | | 2 |
| Construction Traffic | 1 | | | | | 1 | | | | 7 | | 5 |
| **2019 NO BUILD TRAFFIC VOLUMES** | **99** | **150** | | | **245** | **146** | | | | **208** | | **196** |
| Balance Adjustment | 15 | | | | | 21 | | | | 17 | | 17 |
| **2019 NO BUILD TRAFFIC VOLUMES** | **114** | **150** | | | **245** | **167** | | | | **225** | | **213** |
| Years To Buildout (2019) | 4 | 4 | | | 4 | 4 | | | | 4 | | 4 |
| Yearly Growth Rate | 2.0% | 2.0% | | | 2.0% | 2.0% | | | | 2.0% | | 2.0% |
| Background Traffic Growth | 7 | 11 | | | 18 | 10 | | | | 12 | | 12 |
| Volvo Traffic | 3 | | | | | 4 | | | | 36 | | 27 |
| Camp Hall Traffic | 1 | | | | | 2 | | | | 3 | | 2 |
| Construction Traffic | 1 | | | | | 1 | | | | 7 | | 5 |
| **2019 BUILD TRAFFIC VOLUMES** | **99** | **150** | | | **245** | **146** | | | | **208** | | **196** |
| Balance Adjustment | 15 | | | | | 21 | | | | 17 | | 17 |
| **2019 BUILD TRAFFIC VOLUMES** | **114** | **150** | | | **245** | **167** | | | | **225** | | **213** |

# INTERSECTION TRAFFIC VOLUME DEVELOPMENT

## SC 27/Ridgeville Road & I-26 Eastbound Ramps

**TRAFFIC CONTROL: Unsignalized**

**DATE COUNTED: May 7, 2015**

| DESIGN PEAK HOUR (3:00-4:00 PM) | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **2015 TRAFFIC VOLUMES** | **25** | **5** | **59** | | | | | **144** | **105** | **86** | **272** | |
| Years To Buildout (2019) | 4 | 4 | 4 | | | | | 4 | 4 | 4 | 4 | |
| Yearly Growth Rate | 2.0% | 2.0% | 2.0% | | | | | 2.0% | 2.0% | 2.0% | 2.0% | |
| Background Traffic Growth | 2 | 0 | 5 | | | | | 12 | 8 | 7 | 22 | |
| Volvo Traffic | 15 | | | | | | | 7 | | 547 | 63 | |
| Camp Hall Traffic | 7 | | | | | | | 3 | | 43 | 5 | |
| Construction Traffic | 3 | | | | | | | 2 | | 108 | 12 | |
| **2019 NO BUILD TRAFFIC VOLUMES** | **52** | **5** | **64** | | | | | **168** | **113** | **791** | **374** | |
| Balance Adjustment | | | | | | | | | | | | |
| **2019 NO BUILD TRAFFIC VOLUMES** | **52** | **5** | **64** | | | | | **168** | **113** | **791** | **374** | |
| Years To Buildout (2019) | 4 | 4 | 4 | | | | | 4 | 4 | 4 | 4 | |
| Yearly Growth Rate | 2.0% | 2.0% | 2.0% | | | | | 2.0% | 2.0% | 2.0% | 2.0% | |
| Background Traffic Growth | 2 | 0 | 5 | | | | | 12 | 8 | 7 | 22 | |
| Volvo Traffic | 3 | | | | | | | 7 | | 27 | 63 | |
| Camp Hall Traffic | 5 | | | | | | | 3 | | 17 | 5 | |
| Construction Traffic | 1 | | | | | | | 2 | | 5 | 12 | |
| **2019 BUILD TRAFFIC VOLUMES** | **36** | **5** | **64** | | | | | **168** | **113** | **142** | **374** | |
| Balance Adjustment | | | | | | | | | | | | |
| **2019 BUILD TRAFFIC VOLUMES** | **36** | **5** | **64** | | | | | **168** | **113** | **142** | **374** | |

# INTERSECTION TRAFFIC VOLUME DEVELOPMENT

## SC 27/Ridgeville Road & I-26 Westbound Ramps

**TRAFFIC CONTROL: Unsignalized**

**DATE COUNTED: May 7, 2015**

| DESIGN PEAK HOUR (3:00-4:00 PM) | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **2015 TRAFFIC VOLUMES** | | | | **211** | **3** | **153** | **37** | **125** | | | **135** | **14** |
| Years To Buildout (2019) | | | | 4 | 4 | 4 | 4 | 4 | | | 4 | 4 |
| Yearly Growth Rate | | | | 2.0% | 2.0% | 2.0% | 2.0% | 2.0% | | | 2.0% | 2.0% |
| Background Traffic Growth | | | | 17 | 0 | 12 | 3 | 10 | | | 11 | 1 |
| Volvo Traffic | | | | | | 62 | | 22 | | | 610 | 137 |
| Camp Hall Traffic | | | | | | 28 | | 10 | | | 48 | 11 |
| Construction Traffic | | | | | | 12 | | 5 | | | 120 | 27 |
| **2019 NO BUILD TRAFFIC VOLUMES** | | | | **228** | **3** | **267** | **40** | **172** | | | **924** | **190** |
| Balance Adjustment | | | | | | | | 8 | | | 13 | |
| **2019 NO BUILD TRAFFIC VOLUMES** | | | | **228** | **3** | **267** | **40** | **180** | | | **937** | **190** |
| Years To Buildout (2019) | | | | 4 | 4 | 4 | 4 | 4 | | | 4 | 4 |
| Yearly Growth Rate | | | | 2.0% | 2.0% | 2.0% | 2.0% | 2.0% | | | 2.0% | 2.0% |
| Background Traffic Growth | | | | 17 | 0 | 12 | 3 | 10 | | | 11 | 1 |
| Volvo Traffic | | | | | | 3 | | 10 | | | 90 | 27 |
| Camp Hall Traffic | | | | | | 11 | | 8 | | | 22 | 7 |
| Construction Traffic | | | | | | 1 | | 3 | | | 17 | 5 |
| **2019 BUILD TRAFFIC VOLUMES** | | | | **228** | **3** | **180** | **40** | **156** | | | **275** | **54** |
| Balance Adjustment | | | | | | | | 8 | | | 13 | |
| **2019 BUILD TRAFFIC VOLUMES** | | | | **228** | **3** | **180** | **40** | **164** | | | **288** | **54** |

# INTERSECTION TRAFFIC VOLUME DEVELOPMENT

## SC 27/Old Gilliard Road & Lower Westvaco Road

**TRAFFIC CONTROL: Unsignalized**

**DATE COUNTED:**

| DESIGN PEAK HOUR (3:00-4:00 PM) | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **2015 TRAFFIC VOLUMES** | | | | **0** | | **0** | | **278** | **0** | **0** | **149** | |
| Years To Buildout (2019) | | | | 4 | | 4 | | 4 | 4 | 4 | 4 | |
| Yearly Growth Rate | | | | 2.0% | | 2.0% | | 2.0% | 2.0% | 2.0% | 2.0% | |
| Background Traffic Growth | | | | 0 | | 0 | | 22 | 0 | 0 | 12 | |
| Volvo Traffic | | | | 747 | | | | | 84 | | | |
| Camp Hall Traffic | | | | 59 | | | | | 38 | | | |
| Construction Traffic | | | | 147 | | | | | 17 | | | |
| **2019 NO BUILD TRAFFIC VOLUMES** | | | | **953** | | **0** | | **300** | **139** | **0** | **161** | |
| Balance Adjustment | | | | | | | | 8 | | | 13 | |
| **2019 NO BUILD TRAFFIC VOLUMES** | | | | **953** | | **0** | | **308** | **139** | **0** | **174** | |
| Years To Buildout (2019) | | | | 4 | | 4 | | 4 | 4 | 4 | 4 | |
| Yearly Growth Rate | | | | 2.0% | | 2.0% | | 2.0% | 2.0% | 2.0% | 2.0% | |
| Background Traffic Growth | | | | 0 | | 0 | | 22 | 0 | 0 | 12 | |
| Volvo Traffic | | | | 117 | | | | | 13 | | | |
| Camp Hall Traffic | | | | 29 | | | | | 19 | | | |
| Construction Traffic | | | | 22 | | | | | 4 | | | |
| **2019 BUILD TRAFFIC VOLUMES** | | | | **168** | | **0** | | **300** | **36** | **0** | **161** | |
| Balance Adjustment | | | | | | | | 8 | | | 13 | |
| **2019 BUILD TRAFFIC VOLUMES** | | | | **168** | | **0** | | **308** | **36** | **0** | **174** | |

# INTERSECTION TRAFFIC VOLUME DEVELOPMENT

## Jedburg Road & I-26 Eastbound Ramps

**TRAFFIC CONTROL: Signalized**

**DATE COUNTED: May 13, 2015**

| DESIGN PEAK HOUR (3:00-4:00 PM) | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **2015 TRAFFIC VOLUMES** | **56** | **1** | **54** | | | | | **291** | **408** | **160** | **758** | |
| Years To Buildout (2019) | 4 | 4 | 4 | | | | | 4 | 4 | 4 | 4 | |
| Yearly Growth Rate | 2.0% | 2.0% | 2.0% | | | | | 2.0% | 2.0% | 2.0% | 2.0% | |
| Background Traffic Growth | 4 | 0 | 4 | | | | | 23 | 33 | 13 | 61 | |
| **2019 NO BUILD TRAFFIC VOLUMES** | **60** | **1** | **58** | | | | | **314** | **441** | **173** | **819** | |
| Balance Adjustment | | | | | | | | | | | | |
| **2019 NO BUILD TRAFFIC VOLUMES** | **60** | **1** | **58** | | | | | **314** | **441** | **173** | **819** | |
| Years To Buildout (2019) | 4 | 4 | 4 | | | | | 4 | 4 | 4 | 4 | |
| Yearly Growth Rate | 2.0% | 2.0% | 2.0% | | | | | 2.0% | 2.0% | 2.0% | 2.0% | |
| Background Traffic Growth | 4 | 0 | 4 | | | | | 23 | 33 | 13 | 61 | |
| **2019 BUILD TRAFFIC VOLUMES** | **60** | **1** | **58** | | | | | **314** | **441** | **173** | **819** | |
| Balance Adjustment | | | | | | | | | | | | |
| **2019 BUILD TRAFFIC VOLUMES** | **60** | **1** | **58** | | | | | **314** | **441** | **173** | **819** | |

# INTERSECTION TRAFFIC VOLUME DEVELOPMENT

## Jedburg Road & I-26 Westbound Ramps

**TRAFFIC CONTROL: Signalized**

**DATE COUNTED: May 7, 2015**

| DESIGN PEAK HOUR (3:00-4:00 PM) | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **2015 TRAFFIC VOLUMES** | | | | **532** | **3** | **221** | **53** | **241** | | | **378** | **36** |
| Years To Buildout (2019) | | | 4 | 4 | 4 | 4 | 4 | 4 | | | 4 | 4 |
| Yearly Growth Rate | | | 2.0% | 2.0% | 2.0% | 2.0% | 2.0% | 2.0% | | | 2.0% | 2.0% |
| Background Traffic Growth | | | 43 | 43 | 0 | 18 | 4 | 19 | | | 30 | 3 |
| **2019 NO BUILD TRAFFIC VOLUMES** | | | **575** | | | **239** | **57** | **260** | | | **408** | **39** |
| Balance Adjustment | | | | | | | | 57 | | | 9 | |
| **2019 NO BUILD TRAFFIC VOLUMES** | | | **575** | | | **239** | **57** | **317** | | | **417** | **39** |
| Years To Buildout (2019) | | | 4 | 4 | 4 | 4 | 4 | 4 | | | 4 | 4 |
| Yearly Growth Rate | | | 2.0% | 2.0% | 2.0% | 2.0% | 2.0% | 2.0% | | | 2.0% | 2.0% |
| Background Traffic Growth | | | 43 | 43 | 0 | 18 | 4 | 19 | | | 30 | 3 |
| **2019 BUILD TRAFFIC VOLUMES** | | | **575** | | | **239** | **57** | **260** | | | **408** | **39** |
| Balance Adjustment | | | | | | | | 57 | | | 9 | |
| **2019 BUILD TRAFFIC VOLUMES** | | | **575** | | | **239** | **57** | **317** | | | **417** | **39** |

# TRAFFIC VOLUME DEVELOPMENT

## I-26

**DATE COUNTED: Friday, October 3, 2014**

| DESIGN PEAK HOUR (3:00-4:00 PM) | West of SC 27* | | SC 27 to Volvo Car Drive | | Volvo Car Drive to Jedburg Road | | East of Jedburg Road* | |
|---|---|---|---|---|---|---|---|---|
| | EB | WB | EB | WB | EB | WB | EB | WB |
| **2014 TRAFFIC VOLUMES** | | | **2,123** | **2,284** | **2,123** | **2,284** | | |
| **2015 TRAFFIC VOLUMES** | **2,059** | **2,017** | **2,165** | **2,330** | **2,165** | **2,330** | **2,625** | **2,994** |
| Years To Buildout (2019) | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Yearly Growth Rate | 2.0% | 2.0% | 2.0% | 2.0% | 2.0% | 2.0% | 2.0% | 2.0% |
| Background Traffic Growth | 165 | 161 | 173 | 186 | 173 | 186 | 210 | 240 |
| Volvo Traffic | 15 | 137 | 547 | 62 | 547 | 62 | 547 | 62 |
| Camp Hall Traffic | 7 | 11 | 43 | 28 | 43 | 28 | 43 | 28 |
| Construction Traffic | 3 | 27 | 108 | 12 | 108 | 12 | 108 | 12 |
| **2019 NO BUILD TRAFFIC VOLUMES** | **2,249** | **2,353** | **3,037** | **2,618** | **3,037** | **2,618** | **3,533** | **3,336** |
| Years To Buildout (2019) | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Yearly Growth Rate | 2.0% | 2.0% | 2.0% | 2.0% | 2.0% | 2.0% | 2.0% | 2.0% |
| Background Traffic Growth | 165 | 161 | 173 | 186 | 173 | 186 | 210 | 240 |
| Volvo Traffic | 15 | 137 | 39 | 113 | 547 | 62 | 547 | 62 |
| Camp Hall Traffic | 7 | 11 | 19 | 15 | 43 | 28 | 43 | 28 |
| Construction Traffic | 3 | 27 | 7 | 23 | 108 | 12 | 108 | 12 |
| **2019 BUILD TRAFFIC VOLUMES** | **2,249** | **2,353** | **2,404** | **2,667** | **3,037** | **2,618** | **3,533** | **3,336** |

*Freeway volumes derived from the I-26 freeway volumes between Volvo Car Drive and Jedburg Road.

# Appendix C

# 2039 Traffic Volume Development Worksheets

# INTERSECTION TRAFFIC VOLUME DEVELOPMENT

## SC 27/Ridgeville Road & US 78

**TRAFFIC CONTROL: Signalized**

**DATE COUNTED: May 7, 2015**

| DESIGN PEAK HOUR (3:00-4:00 PM) | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **2015 TRAFFIC VOLUMES** | **87** | **139** | | | **227** | **129** | | | | **150** | | **150** |
| Years to Design Year (2039) | 24 | 24 | | | 24 | 24 | | | | 24 | | 24 |
| Yearly Growth Rate | 2.0% | 2.0% | | | 2.0% | 2.0% | | | | 2.0% | | 2.0% |
| Background Traffic Growth | 42 | 67 | | | 109 | 62 | | | | 72 | | 72 |
| Volvo Traffic | 9 | | | | | 12 | | | | 88 | | 67 |
| Camp Hall Traffic | 8 | | | | | 10 | | | | 4 | | 3 |
| **2039 NO BUILD TRAFFIC VOLUMES** | **146** | **206** | | | **336** | **213** | | | | **314** | | **292** |
| Balance Adjustment | 20 | | | | | 28 | | | | 24 | | 22 |
| **2039 NO BUILD TRAFFIC VOLUMES** | **166** | **206** | | | **336** | **241** | | | | **338** | | **314** |
| Years to Design Year (2039) | 24 | 24 | | | 24 | 24 | | | | 24 | | 24 |
| Yearly Growth Rate | 2.0% | 2.0% | | | 2.0% | 2.0% | | | | 2.0% | | 2.0% |
| Background Traffic Growth | 42 | 67 | | | 109 | 62 | | | | 72 | | 72 |
| Volvo Traffic | 9 | | | | | 12 | | | | 88 | | 67 |
| Camp Hall Traffic | 8 | | | | | 10 | | | | 4 | | 3 |
| **2039 BUILD TRAFFIC VOLUMES** | **146** | **206** | | | **336** | **213** | | | | **314** | | **292** |
| Balance Adjustment | 20 | | | | | 28 | | | | 24 | | 22 |
| **2039 BUILD TRAFFIC VOLUMES** | **166** | **206** | | | **336** | **241** | | | | **338** | | **314** |

# INTERSECTION TRAFFIC VOLUME DEVELOPMENT

## SC 27/Ridgeville Road & I-26 Eastbound Ramps

**TRAFFIC CONTROL: Unsignalized**

**DATE COUNTED: May 7, 2015**

| DESIGN PEAK HOUR (3:00-4:00 PM) | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **2015 TRAFFIC VOLUMES** | **25** | **5** | **59** | | | | | **144** | **105** | **86** | **272** | |
| Years to Design Year (2039) | 24 | 24 | 24 | | | | | 24 | 24 | 24 | 24 | |
| Yearly Growth Rate | 2.0% | 2.0% | 2.0% | | | | | 2.0% | 2.0% | 2.0% | 2.0% | |
| Background Traffic Growth | 12 | 2 | 28 | | | | | 69 | 50 | 41 | 131 | |
| Volvo Traffic | 44 | | | | | | | 21 | | 1,326 | 155 | |
| Camp Hall Traffic | 39 | | | | | | | 18 | | 59 | 7 | |
| **2039 NO BUILD TRAFFIC VOLUMES** | **120** | **7** | **87** | | | | | **252** | **155** | **1,512** | **565** | |
| Balance Adjustment | | | | | | | | | | | | |
| **2039 NO BUILD TRAFFIC VOLUMES** | **120** | **7** | **87** | | | | | **252** | **155** | **1,512** | **565** | |
| Years to Design Year (2039) | 24 | 24 | 24 | | | | | 24 | 24 | 24 | 24 | |
| Yearly Growth Rate | 2.0% | 2.0% | 2.0% | | | | | 2.0% | 2.0% | 2.0% | 2.0% | |
| Background Traffic Growth | 12 | 2 | 28 | | | | | 69 | 50 | 41 | 131 | |
| Volvo Traffic | 7 | | | | | | | 21 | | 65 | 155 | |
| Camp Hall Traffic | 26 | | | | | | | 18 | | 24 | 7 | |
| **2039 BUILD TRAFFIC VOLUMES** | **70** | **7** | **87** | | | | | **252** | **155** | **216** | **565** | |
| Balance Adjustment | | | | | | | | | | | | |
| **2039 BUILD TRAFFIC VOLUMES** | **70** | **7** | **87** | | | | | **252** | **155** | **216** | **565** | |

# INTERSECTION TRAFFIC VOLUME DEVELOPMENT

## SC 27/Ridgeville Road & I-26 Westbound Ramps

**TRAFFIC CONTROL: Unsignalized**

**DATE COUNTED: May 7, 2015**

| DESIGN PEAK HOUR (3:00-4:00 PM) | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **2015 TRAFFIC VOLUMES** | | | | **211** | **3** | **153** | **37** | **125** | | | **135** | **14** |
| Years to Design Year (2039) | | | | 24 | 24 | 24 | 24 | 24 | | | 24 | 24 |
| Yearly Growth Rate | | | | 2.0% | 2.0% | 2.0% | 2.0% | 2.0% | | | 2.0% | 2.0% |
| Background Traffic Growth | | | | 101 | 1 | 73 | 18 | 60 | | | 65 | 7 |
| Volvo Traffic | | | | | | 174 | | 65 | | | 1,481 | 332 |
| Camp Hall Traffic | | | | | | 155 | | 57 | | | 66 | 15 |
| **2039 NO BUILD TRAFFIC VOLUMES** | | | | **312** | **4** | **555** | **55** | **307** | | | **1,747** | **368** |
| Balance Adjustment | | | | | | | | 10 | | | 18 | |
| **2039 NO BUILD TRAFFIC VOLUMES** | | | | **312** | **4** | **555** | **55** | **317** | | | **1,765** | **368** |
| Years to Design Year (2039) | | | | 24 | 24 | 24 | 24 | 24 | | | 24 | 24 |
| Yearly Growth Rate | | | | 2.0% | 2.0% | 2.0% | 2.0% | 2.0% | | | 2.0% | 2.0% |
| Background Traffic Growth | | | | 101 | 1 | 73 | 18 | 60 | | | 65 | 7 |
| Volvo Traffic | | | | | | 7 | | 28 | | | 220 | 65 |
| Camp Hall Traffic | | | | | | 62 | | 44 | | | 31 | 10 |
| **2039 BUILD TRAFFIC VOLUMES** | | | | **312** | **4** | **295** | **55** | **257** | | | **451** | **96** |
| Balance Adjustment | | | | | | | | 10 | | | 18 | |
| **2039 BUILD TRAFFIC VOLUMES** | | | | **312** | **4** | **295** | **55** | **267** | | | **469** | **96** |

# INTERSECTION TRAFFIC VOLUME DEVELOPMENT

## SC 27/Old Gilliard Road & Lower Westvaco Road

**TRAFFIC CONTROL: Unsignalized**

**DATE COUNTED:**

| DESIGN PEAK HOUR (3:00-4:00 PM) | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **2015 TRAFFIC VOLUMES** | | | | **0** | | **0** | | **278** | **0** | **0** | **149** | |
| Years to Design Year (2039) | | | | 24 | | 24 | | 24 | 24 | 24 | 24 | |
| Yearly Growth Rate | | | | 2.0% | | 2.0% | | 2.0% | 2.0% | 2.0% | 2.0% | |
| Background Traffic Growth | | | | 0 | | 0 | | 133 | 0 | 0 | 72 | |
| Volvo Traffic | | | | 1,813 | | | | | 239 | | | |
| Camp Hall Traffic | | | | 81 | | | | | 212 | | | |
| **2039 NO BUILD TRAFFIC VOLUMES** | | | | **1,894** | | **0** | | **411** | **451** | **0** | **221** | |
| Balance Adjustment | | | | | | | | 10 | | | 18 | |
| **2039 NO BUILD TRAFFIC VOLUMES** | | | | **1,894** | | **0** | | **421** | **451** | **0** | **239** | |
| Years to Design Year (2039) | | | | 24 | | 24 | | 24 | 24 | 24 | 24 | |
| Yearly Growth Rate | | | | 2.0% | | 2.0% | | 2.0% | 2.0% | 2.0% | 2.0% | |
| Background Traffic Growth | | | | 0 | | 0 | | 133 | 0 | 0 | 72 | |
| Volvo Traffic | | | | 285 | | | | | 35 | | | |
| Camp Hall Traffic | | | | 41 | | | | | 106 | | | |
| **2039 BUILD TRAFFIC VOLUMES** | | | | **326** | | **0** | | **411** | **141** | **0** | **221** | |
| Balance Adjustment | | | | | | | | 10 | | | 18 | |
| **2039 BUILD TRAFFIC VOLUMES** | | | | **326** | | **0** | | **421** | **141** | **0** | **239** | |

# INTERSECTION TRAFFIC VOLUME DEVELOPMENT

## Jedburg Road & I-26 Eastbound Ramps

**TRAFFIC CONTROL: Signalized**

**From Sheep Island Parkway IJR/Jedburg Road IMR**

| DESIGN PEAK HOUR (3:00-4:00 PM) | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **2035 NO BUILD TRAFFIC VOLUMES*** | **130** | | **160** | | | | | **760** | **410** | **215** | **930** | |
| Years to Design Year (2039) | 4 | | 4 | | | | | 4 | 4 | 4 | 4 | |
| Yearly Growth Rate | 2.0% | | 2.0% | | | | | 2.0% | 2.0% | 2.0% | 2.0% | |
| Background Traffic Growth | 10 | | 13 | | | | | 61 | 33 | 17 | 74 | |
| Balance Adjustment | | | | | | | | | | | | |
| **2039 NO BUILD TRAFFIC VOLUMES** | **140** | | **173** | | | | | **821** | **443** | **232** | **1,004** | |
| **2035 BUILD TRAFFIC VOLUMES*** | **130** | | **160** | | | | | **760** | **410** | **215** | **930** | |
| Years to Design Year (2039) | 4 | | 4 | | | | | 4 | 4 | 4 | 4 | |
| Yearly Growth Rate | 2.0% | | 2.0% | | | | | 2.0% | 2.0% | 2.0% | 2.0% | |
| Background Traffic Growth | 10 | | 13 | | | | | 61 | 33 | 17 | 74 | |
| Balance Adjustment | | | | | | | | | | | | |
| **2039 BUILD TRAFFIC VOLUMES** | **140** | | **173** | | | | | **821** | **443** | **232** | **1,004** | |

* Traffic Volumes taken from the May 2010 Sheep Island Parkway IJR/Jedburg Road IMR

# INTERSECTION TRAFFIC VOLUME DEVELOPMENT

## Jedburg Road & I-26 Westbound Ramps

**TRAFFIC CONTROL: Signalized**

**From Sheep Island Parkway IJR/Jedburg Road IMR**

| DESIGN PEAK HOUR (3:00-4:00 PM) | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **2035 NO BUILD TRAFFIC VOLUMES*** | | | **580** | | | **390** | **225** | **665** | | | **565** | **170** |
| Years to Design Year (2039) | | | 4 | | | 4 | 4 | 4 | | | 4 | 4 |
| Yearly Growth Rate | | | 2.0% | | | 2.0% | 2.0% | 2.0% | | | 2.0% | 2.0% |
| Background Traffic Growth | | | 46 | | | 31 | 18 | 53 | | | 45 | 14 |
| Balance Adjustment | | | | | | | | | | | | |
| **2039 NO BUILD TRAFFIC VOLUMES** | | | **626** | | | **421** | **243** | **718** | | | **610** | **184** |
| **2035 BUILD TRAFFIC VOLUMES*** | | | **580** | | | **390** | **225** | **665** | | | **565** | **170** |
| Years to Design Year (2039) | | | 4 | | | 4 | 4 | 4 | | | 4 | 4 |
| Yearly Growth Rate | | | 2.0% | | | 2.0% | 2.0% | 2.0% | | | 2.0% | 2.0% |
| Background Traffic Growth | | | 46 | | | 31 | 18 | 53 | | | 45 | 14 |
| Balance Adjustment | | | | | | | | | | | | |
| **2039 BUILD TRAFFIC VOLUMES** | | | **626** | | | **421** | **243** | **718** | | | **610** | **184** |

* Traffic Volumes taken from the May 2010 Sheep Island Parkway IJR/Jedburg Road IMR

# INTERSECTION TRAFFIC VOLUME DEVELOPMENT

## Volvo Car Drive & Factory Entrance

**TRAFFIC CONTROL: Signalized**

| DESIGN PEAK HOUR (3:00-4:00 PM) | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Volvo Traffic | | | | 120 | | | | | 1080 | | | |
| Camp Hall Traffic | | | | | | | | | | | | |
| **2039 NO BUILD TRAFFIC VOLUMES** | | | | **120** | | **0** | | **0** | **1,080** | **0** | **0** | |
| Volvo Traffic | | 121 | 83 | 37 | 783 | | 745 | | 335 | | | |
| Camp Hall Traffic | | 106 | | | 40 | | | | | | | |
| **2039 BUILD TRAFFIC VOLUMES** | **0** | **227** | **83** | **37** | **823** | **0** | **745** | **0** | **335** | **0** | **0** | **0** |

# INTERSECTION TRAFFIC VOLUME DEVELOPMENT

## Volvo Car Drive & Factory Entrance

**TRAFFIC CONTROL: Signalized**

| INGRESS PEAK HOUR (5:30-6:30 AM) | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Volvo Traffic | | | | 1080 | | | | | 120 | | | |
| Camp Hall Traffic | | | | | | | | | | | | |
| **2039 NO BUILD TRAFFIC VOLUMES** | | | | **1,080** | | **0** | | **0** | **120** | **0** | **0** | |
| Volvo Traffic | | 769 | 745 | 335 | 107 | | 83 | | 37 | | | |
| Camp Hall Traffic | | | | | | | | | | | | |
| **2039 BUILD TRAFFIC VOLUMES** | **0** | **769** | **745** | **335** | **107** | **0** | **83** | **0** | **37** | **0** | **0** | **0** |

# TRAFFIC VOLUME DEVELOPMENT

## I-26

**DATE COUNTED: Friday, October 3, 2014**

| DESIGN PEAK HOUR (3:00-4:00 PM) | West of SC 27* | | SC 27 to Volvo Car Drive | | Volvo Car Drive To Jedburg Road | | East of Jedburg Rd.* | |
|---|---|---|---|---|---|---|---|---|
| | EB | WB | EB | WB | EB | WB | EB | WB |
| **2014 TRAFFIC VOLUMES** | | | **2,123** | **2,284** | **2,123** | **2,284** | | |
| **2015 TRAFFIC VOLUMES** | **2,059** | **2,018** | **2,165** | **2,330** | **2,165** | **2,330** | **2,410** | **2,749** |
| Years to Design Year (2039) | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 |
| Yearly Growth Rate | 2.0% | 2.0% | 2.0% | 2.0% | 2.0% | 2.0% | 2.0% | 2.0% |
| Background Traffic Growth | 988 | 968 | 1,039 | 1,118 | 1,039 | 1,118 | 1,157 | 1,319 |
| Volvo Traffic | 44 | 332 | 1,326 | 174 | 1,326 | 174 | 1,326 | 174 |
| Camp Hall Traffic | 39 | 15 | 59 | 155 | 59 | 155 | 59 | 155 |
| **2039 NO BUILD TRAFFIC VOLUMES** | **3,130** | **3,333** | **4,590** | **3,777** | **4,590** | **3,777** | **4,952** | **4,397** |
| Balance Adjustment | | | | | | | | |
| **2039 NO BUILD TRAFFIC VOLUMES** | **3,130** | **3,333** | **4,590** | **3,777** | **4,590** | **3,777** | **4,952** | **4,397** |
| Years to Design Year (2039) | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 |
| Yearly Growth Rate | 2.0% | 2.0% | 2.0% | 2.0% | 2.0% | 2.0% | 2.0% | 2.0% |
| Background Traffic Growth | 988 | 968 | 1,039 | 1,118 | 1,039 | 1,118 | 1,157 | 1,319 |
| Volvo Traffic | 44 | 332 | 102 | 274 | 1,326 | 174 | 1,326 | 174 |
| Camp Hall Traffic | 39 | 15 | 37 | 67 | 59 | 155 | 59 | 155 |
| **2039 BUILD TRAFFIC VOLUMES** | **3,130** | **3,333** | **3,344** | **3,789** | **4,590** | **3,777** | **4,952** | **4,397** |
| Balance Adjustment | | | | | | | | |
| **2039 BUILD TRAFFIC VOLUMES** | **3,130** | **3,333** | **3,344** | **3,789** | **4,590** | **3,777** | **4,952** | **4,397** |

*Freeway volumes derived from the I-26 freeway volumes between Volvo Car Drive and Jedburg Road.

# Appendix D

# 2019 Freeway Analysis Worksheets

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 8/21/2015 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Eastbound |
| From/To: | West of SC 27 |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2019 Opening Year |
| Description: | 171001612 - No Build |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 2249 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 625 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 1374 | 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 | 1374 | 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 | 18.7 | pc/mi/ln |
| Level of service, LOS | C | |

Phone: Fax:
E-mail:

## Diverge Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency/Co.: | Stantec |
| Date performed: | 8/21/2015 |
| Analysis time period: | 3:00 - 4:00 PM |
| Freeway/Dir of Travel: | I-26 Eastbound |
| Junction: | SC 27 Off-Ramp |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2019 Opening Year |
| Description: | 171001612 - No Build |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Diverge | |
| Number of lanes in freeway | 2 | |
| Free-flow speed on freeway | 75.0 | mph |
| Volume on freeway | 2249 | 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 | 121 | 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 | 909 | vph |
| Position of adjacent ramp | Downstream | |
| Type of adjacent ramp | On | |
| Distance to adjacent ramp | 2330 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | Ramp | Adjacent Ramp | |
|---|---|---|---|---|
| Volume, V (vph) | 2249 | 121 | 909 | vph |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | |
| Peak 15-min volume, v15 | 625 | 34 | 253 | v |
| Trucks and buses | 20 | 20 | 20 | % |
| Recreational vehicles | 0 | 0 | 0 | % |
| Terrain type: | Level | Level | Level | |
| Grade | 0.00 % | 0.00 % | 0.00 % | |
| Length | 0.00 mi | 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 | 0.909 | 0.909 | 0.909 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 2749 | 148 | 1111 | pcph |

## Estimation of V12 Diverge Areas

$L_{EQ}$ = (Equation 13-12 or 13-13)

$P_{FD}$ = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2749 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{Fi} = v_F$ | 2749 | 4800 | No |
| $v_{FO} = v_F - v_R$ | 2601 | 4800 | No |
| $v_R$ | 148 | 2000 | 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, $v_{12A}$ = 2749 (Equation 13-15, 13-16, 13-18, or 13-19)

## Flow Entering Diverge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{12}$ | 2749 | 4400 | No |

## Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, L_{12}$ = 23.8 pc/mi/ln

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

## Speed Estimation

| | | |
|---|---|---|
| Intermediate speed variable, | $D_S$ = 0.441 | |
| Space mean speed in ramp influence area, | $S_R$ = 60.4 | mph |
| Space mean speed in outer lanes, | $S_O$ = N/A | mph |
| Space mean speed for all vehicles, | $S$ = 60.4 | mph |

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 8/21/2015 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Eastbound |
| From/To: | SC 27 Interchange |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2019 Opening Year |
| Description: | 171001612 - No Build |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 2128 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 591 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 1300 | 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 | 1300 | pc/h/ln |
| Free-flow speed, FFS | 75.4 | mi/h |
| Average passenger-car speed, S | 74.0 | mi/h |
| Number of lanes, N | 2 | |
| Density, D | 17.6 | pc/mi/ln |
| Level of service, LOS | B | |

Phone: Fax:
E-mail:

## Merge Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency/Co.: | Stantec |
| Date performed: | 8/21/2015 |
| Analysis time period: | 3:00 - 4:00 PM |
| Freeway/Dir of Travel: | I-26 Eastbound |
| Junction: | SC 27 On-Ramp |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2019 Opening Year |
| Description: | 171001612 - No Build |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Merge | |
| Number of lanes in freeway | 2 | |
| Free-flow speed on freeway | 75.0 | mph |
| Volume on freeway | 2128 | 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 | 909 | 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 | 121 | vph |
| Position of adjacent Ramp | Upstream | |
| Type of adjacent Ramp | Off | |
| Distance to adjacent Ramp | 2330 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | Ramp | Adjacent Ramp | |
|---|---|---|---|---|
| Volume, V (vph) | 2128 | 909 | 121 | vph |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | |
| Peak 15-min volume, v15 | 591 | 253 | 34 | v |
| Trucks and buses | 20 | 20 | 20 | % |
| 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 | 0.909 | 0.909 | 0.909 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 2601 | 1111 | 148 | pcph |

## Estimation of V12 Merge Areas

$L_{EQ}$ = (Equation 13-6 or 13-7)

$P_{FM}$ = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2601 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{FO}$ | 3712 | 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, $v_{12A}$ = 2601 (Equation 13-15, 13-16, 13-18, or 13-19)

## Flow Entering Merge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{R12}$ | 3712 | 4600 | No |

## Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 28.9 pc/mi/ln

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

## Speed Estimation

| | | |
|---|---|---|
| Intermediate speed variable, | $M_S$ = 0.425 | |
| Space mean speed in ramp influence area, | $S_R$ = 61.0 | mph |
| Space mean speed in outer lanes, | $S_0$ = N/A | mph |
| Space mean speed for all vehicles, | $S$ = 61.0 | mph |

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 8/21/2015 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Eastbound |
| From/To: | SC 27 to Jedburg |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2019 Opening Year |
| Description: | 171001612 - No Build |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 3037 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 844 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 1856 | 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 | 1856 | pc/h/ln |
| Free-flow speed, FFS | 75.4 | mi/h |
| Average passenger-car speed, S | 66.9 | mi/h |
| Number of lanes, N | 2 | |
| Density, D | 27.7 | pc/mi/ln |
| Level of service, LOS | D | |

Phone: Fax:
E-mail:

## Diverge Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency/Co.: | Stantec |
| Date performed: | 8/21/2015 |
| Analysis time period: | 3:00 - 4:00 PM |
| Freeway/Dir of Travel: | I-26 Eastbound |
| Junction: | Jedburg Off-Ramp |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2019 Opening Year |
| Description: | 171001612 - No Build |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Diverge | |
| Number of lanes in freeway | 2 | |
| Free-flow speed on freeway | 75.0 | mph |
| Volume on freeway | 3037 | 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 | 500 | ft |
| Length of second accel/decel lane | | ft |

## Adjacent Ramp Data (if one exists)

| | | |
|---|---|---|
| Does adjacent ramp exist? | Yes | |
| Volume on adjacent ramp | 615 | vph |
| Position of adjacent ramp | Downstream | |
| Type of adjacent ramp | On | |
| Distance to adjacent ramp | 1620 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | | Ramp | | Adjacent Ramp | | |
|---|---|---|---|---|---|---|---|
| Volume, V (vph) | 3037 | | 119 | | 615 | | vph |
| Peak-hour factor, PHF | 0.90 | | 0.90 | | 0.90 | | |
| Peak 15-min volume, v15 | 844 | | 33 | | 171 | | v |
| Trucks and buses | 20 | | 20 | | 20 | | % |
| Recreational vehicles | 0 | | 0 | | 0 | | % |
| Terrain type: | Level | | Level | | Level | | |
| Grade | 0.00 | % | 0.00 | % | 0.00 | % | |
| Length | 0.00 | mi | 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 | 0.909 | 0.909 | 0.909 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 3712 | 145 | 752 | pcph |

## Estimation of V12 Diverge Areas

$L_{EQ}$ = (Equation 13-12 or 13-13)

$P_{FD}$ = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3712 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{Fi} = v_F$ | 3712 | 4800 | No |
| $v_{FO} = v_F - v_R$ | 3567 | 4800 | No |
| $v_R$ | 145 | 2000 | 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, $v_{12A}$ = 3712 (Equation 13-15, 13-16, 13-18, or 13-19)

## Flow Entering Diverge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{12}$ | 3712 | 4400 | No |

## Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, L_{12}$ = 31.7 pc/mi/ln

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

## Speed Estimation

| | | |
|---|---|---|
| Intermediate speed variable, | $D_S$ = 0.441 | |
| Space mean speed in ramp influence area, | $S_R$ = 60.4 | mph |
| Space mean speed in outer lanes, | $S_O$ = N/A | mph |
| Space mean speed for all vehicles, | $S$ = 60.4 | mph |

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 8/21/2015 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Eastbound |
| From/To: | Jedburg Interchange |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2019 Opening Year |
| Description: | 171001612 - No Build |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 2918 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 811 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 1783 | 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 | 1783 | pc/h/ln |
| Free-flow speed, FFS | 75.4 | mi/h |
| Average passenger-car speed, S | 68.2 | mi/h |
| Number of lanes, N | 2 | |
| Density, D | 26.1 | pc/mi/ln |
| Level of service, LOS | D | |

Phone: Fax:
E-mail:

## Merge Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency/Co.: | Stantec |
| Date performed: | 8/21/2015 |
| Analysis time period: | 3:00 - 4:00 PM |
| Freeway/Dir of Travel: | I-26 Eastbound |
| Junction: | Jedburg On-Ramp |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2019 Opening Year |
| Description: | 171001612 - No Build |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Merge | |
| Number of lanes in freeway | 2 | |
| Free-flow speed on freeway | 75.0 | mph |
| Volume on freeway | 2918 | 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 | 615 | vph |
| Length of first accel/decel lane | 1150 | 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 | 1620 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | Ramp | Adjacent Ramp | |
|---|---|---|---|---|
| Volume, V (vph) | 2918 | 615 | 119 | vph |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | |
| Peak 15-min volume, v15 | 811 | 171 | 33 | v |
| Trucks and buses | 20 | 20 | 20 | % |
| 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 | 0.909 | 0.909 | 0.909 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 3566 | 752 | 145 | pcph |

## Estimation of V12 Merge Areas

$L_{EQ}$ = (Equation 13-6 or 13-7)

$P_{FM}$ = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 3566 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{FO}$ | 4318 | 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, $v_{12A}$ = 3566 (Equation 13-15, 13-16, 13-18, or 13-19)

## Flow Entering Merge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{R12}$ | 4318 | 4600 | No |

## Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 31.6 pc/mi/ln

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

## Speed Estimation

| | | |
|---|---|---|
| Intermediate speed variable, | $M_S$ = 0.533 | |
| Space mean speed in ramp influence area, | $S_R$ = 57.4 | mph |
| Space mean speed in outer lanes, | $S_O$ = N/A | mph |
| Space mean speed for all vehicles, | $S$ = 57.4 | mph |

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 8/21/2015 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Eastbound |
| From/To: | East of Jedburg |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2019 Opening Year |
| Description: | 171001612 - No Build |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 3533 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 981 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 2159 | pc/h/ln |

## Speed Inputs and Adjustments

| | | |
|---|---|---|
| Lane width | 12.0 | ft |
| Right-side lateral clearance | 6.0 | ft |
| Total ramp density, TRD | 1.17 | 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 | 3.7 | mi/h |
| Free-flow speed, FFS | 71.7 | mi/h |

## LOS and Performance Measures

| | | |
|---|---|---|
| Flow rate, vp | 2159 | pc/h/ln |
| Free-flow speed, FFS | 71.7 | mi/h |
| Average passenger-car speed, S | 59.3 | mi/h |
| Number of lanes, N | 2 | |
| Density, D | 36.4 | pc/mi/ln |
| Level of service, LOS | E | |

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 8/21/2015 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Westbound |
| From/To: | East of Jedburg |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2019 Opening Year |
| Description: | 171001612 - No Build |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 3336 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 927 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 2039 | 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 | 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 | 4.1 | mi/h |
| Free-flow speed, FFS | 71.3 | mi/h |

## LOS and Performance Measures

| | | |
|---|---|---|
| Flow rate, vp | 2039 | pc/h/ln |
| Free-flow speed, FFS | 71.3 | mi/h |
| Average passenger-car speed, S | 61.8 | mi/h |
| Number of lanes, N | 2 | |
| Density, D | 33.0 | pc/mi/ln |
| Level of service, LOS | D | |

Phone: Fax:
E-mail:

## Diverge Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency/Co.: | Stantec |
| Date performed: | 8/21/2015 |
| Analysis time period: | 3:00 - 4:00 PM |
| Freeway/Dir of Travel: | I-26 Westbound |
| Junction: | Jedburg Off-Ramp |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2019 Opening Year |
| Description: | 171001612 - No Build |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Diverge | |
| Number of lanes in freeway | 2 | |
| Free-flow speed on freeway | 71.3 | mph |
| Volume on freeway | 3336 | 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 | 239 | vph |
| Length of first accel/decel lane | 750 | ft |
| Length of second accel/decel lane | | ft |

## Adjacent Ramp Data (if one exists)

| | | |
|---|---|---|
| Does adjacent ramp exist? | Yes | |
| Volume on adjacent ramp | 575 | vph |
| Position of adjacent ramp | Downstream | |
| 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) | 3336 | 239 | 575 | vph |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | |
| Peak 15-min volume, v15 | 927 | 66 | 160 | v |
| Trucks and buses | 20 | 20 | 20 | % |
| Recreational vehicles | 0 | 0 | 0 | % |
| Terrain type: | Level | Level | Level | |
| Grade | 0.00 % | 0.00 % | 0.00 % | |
| Length | 0.00 mi | 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 | 0.909 | 0.909 | 0.909 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 4077 | 292 | 703 | pcph |

## Estimation of V12 Diverge Areas

$L_{EQ}$ = (Equation 13-12 or 13-13)

$P_{FD}$ = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 4077 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{Fi} = v_F$ | 4077 | 4800 | No |
| $v_{FO} = v_F - v_R$ | 3785 | 4800 | No |
| $v_R$ | 292 | 2000 | 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, $v_{12A}$ = 4077 (Equation 13-15, 13-16, 13-18, or 13-19)

## Flow Entering Diverge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{12}$ | 4077 | 4400 | No |

## Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 32.6 pc/mi/ln

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

## Speed Estimation

| | | |
|---|---|---|
| Intermediate speed variable, | $D_S$ = 0.454 | |
| Space mean speed in ramp influence area, | $S_R$ = 58.0 | mph |
| Space mean speed in outer lanes, | $S_0$ = N/A | mph |
| Space mean speed for all vehicles, | $S$ = 58.0 | mph |

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 8/21/2015 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Westbound |
| From/To: | Jedburg Interchange |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2019 Opening Year |
| Description: | 171001612 - No Build |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 3097 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 860 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 1893 | 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 | 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 | 4.1 | mi/h |
| Free-flow speed, FFS | 71.3 | mi/h |

## LOS and Performance Measures

| | | |
|---|---|---|
| Flow rate, vp | 1893 | pc/h/ln |
| Free-flow speed, FFS | 71.3 | mi/h |
| Average passenger-car speed, S | 64.4 | mi/h |
| Number of lanes, N | 2 | |
| Density, D | 29.4 | pc/mi/ln |
| Level of service, LOS | D | |

Phone: Fax:
E-mail:

## Diverge Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency/Co.: | Stantec |
| Date performed: | 8/21/2015 |
| Analysis time period: | 3:00 - 4:00 PM |
| Freeway/Dir of Travel: | I-26 Westbound |
| Junction: | Jedburg Loop Off-Ramp |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2019 Opening Year |
| Description: | 171001612 - No Build |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Diverge | |
| Number of lanes in freeway | 2 | |
| Free-flow speed on freeway | 71.3 | mph |
| Volume on freeway | 3097 | 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 | 575 | vph |
| Length of first accel/decel lane | 750 | ft |
| Length of second accel/decel lane | | ft |

## Adjacent Ramp Data (if one exists)

| | | |
|---|---|---|
| Does adjacent ramp exist? | Yes | |
| Volume on adjacent ramp | 239 | 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) | 3097 | | 575 | | 239 | | vph |
| Peak-hour factor, PHF | 0.90 | | 0.90 | | 0.90 | | |
| Peak 15-min volume, v15 | 860 | | 160 | | 66 | | v |
| Trucks and buses | 20 | | 20 | | 20 | | % |
| Recreational vehicles | 0 | | 0 | | 0 | | % |
| Terrain type: | Level | | Level | | Level | | |
| Grade | 0.00 | % | 0.00 | % | 0.00 | % | |
| Length | 0.00 | mi | 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 | 0.909 | 0.909 | 0.909 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 3785 | 703 | 292 | pcph |

## Estimation of V12 Diverge Areas

$L_{EQ}$ = (Equation 13-12 or 13-13)

$P_{FD}$ = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3785 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{Fi} = v_F$ | 3785 | 4800 | No |
| $v_{FO} = v_F - v_R$ | 3082 | 4800 | No |
| $v_R$ | 703 | 2000 | 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, $v_{12A}$ = 3785 (Equation 13-15, 13-16, 13-18, or 13-19)

## Flow Entering Diverge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{12}$ | 3785 | 4400 | No |

## Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, L_{12}$ = 30.1 pc/mi/ln

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

## Speed Estimation

Intermediate speed variable, $D_S$ = 0.491

Space mean speed in ramp influence area, $S_R$ = 56.9 mph

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

Space mean speed for all vehicles, $S$ = 56.9 mph

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 8/21/2015 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Westbound |
| From/To: | Jedburg Loop Ramp to On-Ramp |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2019 Opening Year |
| Description: | 171001612 - No Build |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 2522 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 701 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| 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 | 1.33 | 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 | 4.1 | mi/h |
| Free-flow speed, FFS | 71.3 | mi/h |

## LOS and Performance Measures

| | | |
|---|---|---|
| Flow rate, vp | 1541 | pc/h/ln |
| Free-flow speed, FFS | 71.3 | mi/h |
| Average passenger-car speed, S | 68.7 | mi/h |
| Number of lanes, N | 2 | |
| Density, D | 22.4 | pc/mi/ln |
| Level of service, LOS | C | |

Phone: Fax:
E-mail:

## Merge Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency/Co.: | Stantec |
| Date performed: | 8/21/2015 |
| Analysis time period: | 3:00 - 4:00 PM |
| Freeway/Dir of Travel: | I-26 Westbound |
| Junction: | Jedburg On-Ramp |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2019 Opening Year |
| Description: | 171001612 - No Build |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Merge | |
| Number of lanes in freeway | 2 | |
| Free-flow speed on freeway | 71.3 | mph |
| Volume on freeway | 2522 | 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 | 96 | vph |
| Length of first accel/decel lane | 1300 | ft |
| Length of second accel/decel lane | | ft |

## Adjacent Ramp Data (if one exists)

| | | |
|---|---|---|
| Does adjacent ramp exist? | Yes | |
| Volume on adjacent Ramp | 575 | vph |
| Position of adjacent Ramp | Upstream | |
| Type of adjacent Ramp | Off | |
| Distance to adjacent Ramp | 900 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | Ramp | Adjacent Ramp | |
|---|---|---|---|---|
| Volume, V (vph) | 2522 | 96 | 575 | vph |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | |
| Peak 15-min volume, v15 | 701 | 27 | 160 | v |
| Trucks and buses | 20 | 20 | 20 | % |
| 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 | 0.909 | 0.909 | 0.909 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 3082 | 117 | 703 | pcph |

## Estimation of V12 Merge Areas

$L_{EQ}$ = (Equation 13-6 or 13-7)

$P_{FM}$ = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 3082 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{FO}$ | 3199 | 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, $v_{12A}$ = 3082 (Equation 13-15, 13-16, 13-18, or 13-19)

## Flow Entering Merge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{R12}$ | 3199 | 4600 | No |

## Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 22.2 pc/mi/ln

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

## Speed Estimation

Intermediate speed variable, $M_S$ = 0.326

Space mean speed in ramp influence area, $S_R$ = 61.8 mph

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

Space mean speed for all vehicles, $S$ = 61.8 mph

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 8/21/2015 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Westbound |
| From/To: | Jedburg to SC 27 |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2019 Opening Year |
| Description: | 171001612 - No Build |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 2618 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 727 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 1600 | 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 | 1600 | pc/h/ln |
| Free-flow speed, FFS | 75.4 | mi/h |
| Average passenger-car speed, S | 71.0 | mi/h |
| Number of lanes, N | 2 | |
| Density, D | 22.5 | pc/mi/ln |
| Level of service, LOS | C | |

HCS 2010: Freeway Merge and Diverge Segments Release 6.60

Phone: Fax:
E-mail:

## Diverge Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency/Co.: | Stantec |
| Date performed: | 8/21/2015 |
| Analysis time period: | 3:00 - 4:00 PM |
| Freeway/Dir of Travel: | I-26 Westbound |
| Junction: | SC 27 Off-Ramp |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2019 Opening Year |
| Description: | 171001612 - No Build |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Diverge | |
| Number of lanes in freeway | 2 | |
| Free-flow speed on freeway | 75.0 | mph |
| Volume on freeway | 2618 | 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 | 498 | 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 | 233 | vph |
| Position of adjacent ramp | Downstream | |
| Type of adjacent ramp | On | |
| Distance to adjacent ramp | 2175 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | Ramp | Adjacent Ramp | |
|---|---|---|---|---|
| Volume, V (vph) | 2618 | 498 | 233 | vph |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | |
| Peak 15-min volume, v15 | 727 | 138 | 65 | v |
| Trucks and buses | 20 | 20 | 20 | % |
| Recreational vehicles | 0 | 0 | 0 | % |
| Terrain type: | Level | Level | Level | |
| Grade | 0.00 % | 0.00 % | 0.00 % | |
| Length | 0.00 mi | 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 | 0.909 | 0.909 | 0.909 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 3200 | 609 | 285 | pcph |

## Estimation of V12 Diverge Areas

$L_{EQ}$ = (Equation 13-12 or 13-13)

$P_{FD}$ = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3200 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{Fi} = v_F$ | 3200 | 4800 | No |
| $v_{FO} = v_F - v_R$ | 2591 | 4800 | No |
| $v_R$ | 609 | 2000 | 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, $v_{12A}$ = 3200 (Equation 13-15, 13-16, 18, or 19)

## Flow Entering Diverge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{12}$ | 3200 | 4400 | No |

## Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, L_D$ = 27.3 pc/mi/ln

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

## Speed Estimation

Intermediate speed variable, $D_S$ = 0.483

Space mean speed in ramp influence area, $S_R$ = 59.1 mph

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

Space mean speed for all vehicles, $S$ = 59.1 mph

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 8/21/2015 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Westbound |
| From/To: | SC 27 Interchange |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2019 Opening Year |
| Description: | 171001612 - No Build |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 2120 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 589 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 1296 | 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 | 1296 | pc/h/ln |
| Free-flow speed, FFS | 75.4 | mi/h |
| Average passenger-car speed, S | 74.0 | mi/h |
| Number of lanes, N | 2 | |
| Density, D | 17.5 | pc/mi/ln |
| Level of service, LOS | B | |

Phone: Fax:
E-mail:

## Merge Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency/Co.: | Stantec |
| Date performed: | 8/21/2015 |
| Analysis time period: | 3:00 - 4:00 PM |
| Freeway/Dir of Travel: | I-26 Westbound |
| Junction: | SC 27 On-Ramp |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2019 Opening Year |
| Description: | 171001612 - No Build |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Merge | |
| Number of lanes in freeway | 2 | |
| Free-flow speed on freeway | 75.0 | mph |
| Volume on freeway | 2120 | 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 | 233 | vph |
| Length of first accel/decel lane | 925 | ft |
| Length of second accel/decel lane | | ft |

## Adjacent Ramp Data (if one exists)

| | | |
|---|---|---|
| Does adjacent ramp exist? | Yes | |
| Volume on adjacent Ramp | 498 | vph |
| Position of adjacent Ramp | Upstream | |
| Type of adjacent Ramp | Off | |
| Distance to adjacent Ramp | 2175 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | Ramp | Adjacent Ramp | |
|---|---|---|---|---|
| Volume, V (vph) | 2120 | 233 | 498 | vph |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | |
| Peak 15-min volume, v15 | 589 | 65 | 138 | v |
| Trucks and buses | 20 | 20 | 20 | % |
| 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 | 0.909 | 0.909 | 0.909 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 2591 | 285 | 609 | pcph |

## Estimation of V12 Merge Areas

$L_{EQ}$ = (Equation 13-6 or 13-7)

$P_{FM}$ = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2591 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{FO}$ | 2876 | 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, $v_{12A}$ = 2591 (Equation 13-15, 13-16, 13-18, or 13-19)

## Flow Entering Merge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{R12}$ | 2876 | 4600 | No |

## Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 22.0 pc/mi/ln

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

## Speed Estimation

| | | |
|---|---|---|
| Intermediate speed variable, | $M_S$ = 0.325 | |
| Space mean speed in ramp influence area, | $S_R$ = 64.3 | mph |
| Space mean speed in outer lanes, | $S_0$ = N/A | mph |
| Space mean speed for all vehicles, | $S$ = 64.3 | mph |

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 8/21/2015 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Westbound |
| From/To: | West of SC 27 |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2019 Opening Year |
| Description: | 171001612 - No Build |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 2353 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 654 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 1438 | 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 | 1438 | pc/h/ln |
| Free-flow speed, FFS | 75.4 | 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 | |

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 8/21/2015 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Eastbound |
| From/To: | West of SC 27 |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2019 Opening Year |
| Description: | 171001612 - Build |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 2249 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 625 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 1374 | 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 | 1374 | 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 | 18.7 | pc/mi/ln |
| Level of service, LOS | C | |

Phone: Fax:
E-mail:

## Diverge Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency/Co.: | Stantec |
| Date performed: | 8/21/2015 |
| Analysis time period: | 3:00 - 4:00 PM |
| Freeway/Dir of Travel: | I-26 Eastbound |
| Junction: | SC 27 Off-Ramp |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2019 Opening Year |
| Description: | 171001612 - Build |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Diverge | |
| Number of lanes in freeway | 2 | |
| Free-flow speed on freeway | 75.0 | mph |
| Volume on freeway | 2249 | 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 | 105 | 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 | 260 | vph |
| Position of adjacent ramp | Downstream | |
| Type of adjacent ramp | On | |
| Distance to adjacent ramp | 2330 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | Ramp | Adjacent Ramp | |
|---|---|---|---|---|
| Volume, V (vph) | 2249 | 105 | 260 | vph |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | |
| Peak 15-min volume, v15 | 625 | 29 | 72 | v |
| Trucks and buses | 20 | 20 | 20 | % |
| Recreational vehicles | 0 | 0 | 0 | % |
| Terrain type: | Level | Level | Level | |
| Grade | 0.00 % | 0.00 % | 0.00 % | |
| Length | 0.00 mi | 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 | 0.909 | 0.909 | 0.909 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 2749 | 128 | 318 | pcph |

## Estimation of V12 Diverge Areas

$L_{EQ}$ = (Equation 13-12 or 13-13)

$P_{FD}$ = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2749 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{Fi} = v_F$ | 2749 | 4800 | No |
| $v_{FO} = v_F - v_R$ | 2621 | 4800 | No |
| $v_R$ | 128 | 2000 | 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, $v_{12A}$ = 2749 (Equation 13-15, 13-16, 13-18, or 13-19)

## Flow Entering Diverge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{12}$ | 2749 | 4400 | No |

## Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 23.8 pc/mi/ln

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

## Speed Estimation

Intermediate speed variable, $D_S$ = 0.440

Space mean speed in ramp influence area, $S_R$ = 60.5 mph

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

Space mean speed for all vehicles, $S$ = 60.5 mph

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 8/21/2015 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Eastbound |
| From/To: | SC 27 Interchange |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2019 Opening Year |
| Description: | 171001612 - Build |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 2144 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 596 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 1310 | 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 | 1310 | pc/h/ln |
| Free-flow speed, FFS | 75.4 | mi/h |
| Average passenger-car speed, S | 73.9 | mi/h |
| Number of lanes, N | 2 | |
| Density, D | 17.7 | pc/mi/ln |
| Level of service, LOS | B | |

Phone: Fax:
E-mail:

## Merge Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency/Co.: | Stantec |
| Date performed: | 8/21/2015 |
| Analysis time period: | 3:00 - 4:00 PM |
| Freeway/Dir of Travel: | I-26 Eastbound |
| Junction: | SC 27 On-Ramp |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2019 Opening Year |
| Description: | 171001612 - Build |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Merge | |
| Number of lanes in freeway | 2 | |
| Free-flow speed on freeway | 75.0 | mph |
| Volume on freeway | 2144 | 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 | 260 | 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 | 105 | vph |
| Position of adjacent Ramp | Upstream | |
| Type of adjacent Ramp | Off | |
| Distance to adjacent Ramp | 2330 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | Ramp | Adjacent Ramp | |
|---|---|---|---|---|
| Volume, V (vph) | 2144 | 260 | 105 | vph |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | |
| Peak 15-min volume, v15 | 596 | 72 | 29 | v |
| Trucks and buses | 20 | 20 | 20 | % |
| 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 | 0.909 | 0.909 | 0.909 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 2620 | 318 | 128 | pcph |

## Estimation of V12 Merge Areas

$L_{EQ}$ = (Equation 13-6 or 13-7)

$P_{FM}$ = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2620 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{FO}$ | 2938 | 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, $v_{12A}$ = 2620 (Equation 13-15, 13-16, 13-18, or 13-19)

## Flow Entering Merge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{R12}$ | 2938 | 4600 | No |

## Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ = 23.2 pc/mi/ln

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

## Speed Estimation

Intermediate speed variable, $M_S$ = 0.339

Space mean speed in ramp influence area, $S_R$ = 63.8 mph

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

Space mean speed for all vehicles, $S$ = 63.8 mph

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 8/21/2015 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Eastbound |
| From/To: | SC 27 to New Interchange |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2019 Opening Year |
| Description: | 171001612 - Build |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 2404 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 668 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 1469 | 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 | 1469 | pc/h/ln |
| Free-flow speed, FFS | 73.1 | 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 | |

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 8/21/2015 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Eastbound |
| From/To: | New Interchange Off-Ramp Area |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2019 Opening Year |
| Description: | 171001612 - Build |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 2404 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 668 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| 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 | |

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 8/21/2015 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Eastbound |
| From/To: | New Interchange |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2019 Opening Year |
| Description: | 171001612 - Build |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 2388 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 663 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 1459 | 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 | 1459 | pc/h/ln |
| Free-flow speed, FFS | 73.1 | mi/h |
| Average passenger-car speed, S | 72.7 | mi/h |
| Number of lanes, N | 2 | |
| Density, D | 20.1 | pc/mi/ln |
| Level of service, LOS | C | |

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 8/21/2015 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Eastbound |
| From/To: | New Interchange 2 On Ramp |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2019 Opening Year |
| Description: | 171001612 - Build |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 3037 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 844 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 928 | 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 | 4 | |
| Free-flow speed: | Base | |
| FFS 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 | 928 | pc/h/ln |
| Free-flow speed, FFS | 73.1 | mi/h |
| Average passenger-car speed, S | 75.0 | mi/h |
| Number of lanes, N | 4 | |
| Density, D | 12.4 | pc/mi/ln |
| Level of service, LOS | B | |

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 8/21/2015 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Eastbound |
| From/To: | New Interchange 1 On Ramp |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2019 Opening Year |
| Description: | 171001612 - Build |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 3037 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 844 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 1237 | 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 | 1237 | pc/h/ln |
| Free-flow speed, FFS | 73.1 | mi/h |
| Average passenger-car speed, S | 74.4 | mi/h |
| Number of lanes, N | 3 | |
| Density, D | 16.6 | pc/mi/ln |
| Level of service, LOS | B | |

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 8/21/2015 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Eastbound |
| From/To: | New Interchange to Jedburg |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2019 Opening Year |
| Description: | 171001612 - Build |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 3037 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 844 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 1856 | 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 | 1856 | pc/h/ln |
| Free-flow speed, FFS | 73.1 | mi/h |
| Average passenger-car speed, S | 66.9 | mi/h |
| Number of lanes, N | 2 | |
| Density, D | 27.7 | pc/mi/ln |
| Level of service, LOS | D | |

Phone: Fax:
E-mail:

## Diverge Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency/Co.: | Stantec |
| Date performed: | 8/21/2015 |
| Analysis time period: | 3:00 - 4:00 PM |
| Freeway/Dir of Travel: | I-26 Eastbound |
| Junction: | Jedburg Off-Ramp |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2019 Opening Year |
| Description: | 171001612 - Build |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Diverge | |
| Number of lanes in freeway | 2 | |
| Free-flow speed on freeway | 73.1 | mph |
| Volume on freeway | 3037 | 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 | 500 | ft |
| Length of second accel/decel lane | | ft |

## Adjacent Ramp Data (if one exists)

| | | |
|---|---|---|
| Does adjacent ramp exist? | Yes | |
| Volume on adjacent ramp | 615 | vph |
| Position of adjacent ramp | Downstream | |
| Type of adjacent ramp | On | |
| Distance to adjacent ramp | 1620 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | | Ramp | | Adjacent Ramp | | |
|---|---|---|---|---|---|---|---|
| Volume, V (vph) | 3037 | | 119 | | 615 | | vph |
| Peak-hour factor, PHF | 0.90 | | 0.90 | | 0.90 | | |
| Peak 15-min volume, v15 | 844 | | 33 | | 171 | | v |
| Trucks and buses | 20 | | 20 | | 20 | | % |
| Recreational vehicles | 0 | | 0 | | 0 | | % |
| Terrain type: | Level | | Level | | Level | | |
| Grade | 0.00 | % | 0.00 | % | 0.00 | % | |
| Length | 0.00 | mi | 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 | 0.909 | 0.909 | 0.909 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 3712 | 145 | 752 | pcph |

## Estimation of V12 Diverge Areas

$L_{EQ}$ = (Equation 13-12 or 13-13)

$P_{FD}$ = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3712 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{Fi} = v_F$ | 3712 | 4800 | No |
| $v_{FO} = v_F - v_R$ | 3567 | 4800 | No |
| $v_R$ | 145 | 2000 | 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, $v_{12A}$ = 3712 (Equation 13-15, 13-16, 13-18, or 13-19)

## Flow Entering Diverge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{12}$ | 3712 | 4400 | No |

## Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, L_{12}$ = 31.7 pc/mi/ln

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

## Speed Estimation

| | | |
|---|---|---|
| Intermediate speed variable, | $D_S$ = 0.441 | |
| Space mean speed in ramp influence area, | $S_R$ = 59.4 | mph |
| Space mean speed in outer lanes, | $S_0$ = N/A | mph |
| Space mean speed for all vehicles, | $S$ = 59.4 | mph |

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 8/21/2015 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Eastbound |
| From/To: | Jedburg Interchange |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2019 Opening Year |
| Description: | 171001612 - Build |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 2918 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 811 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 1783 | 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 | 1783 | pc/h/ln |
| Free-flow speed, FFS | 73.1 | mi/h |
| Average passenger-car speed, S | 68.2 | mi/h |
| Number of lanes, N | 2 | |
| Density, D | 26.1 | pc/mi/ln |
| Level of service, LOS | D | |

Phone: Fax:
E-mail:

## Merge Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency/Co.: | Stantec |
| Date performed: | 8/21/2015 |
| Analysis time period: | 3:00 - 4:00 PM |
| Freeway/Dir of Travel: | I-26 Eastbound |
| Junction: | Jedburg On-Ramp |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2019 Opening Year |
| Description: | 171001612 - Build |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Merge | |
| Number of lanes in freeway | 2 | |
| Free-flow speed on freeway | 73.1 | mph |
| Volume on freeway | 2918 | 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 | 615 | vph |
| Length of first accel/decel lane | 1150 | 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 | 1620 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | Ramp | Adjacent Ramp | |
|---|---|---|---|---|
| Volume, V (vph) | 2918 | 615 | 119 | vph |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | |
| Peak 15-min volume, v15 | 811 | 171 | 33 | v |
| Trucks and buses | 20 | 20 | 20 | % |
| 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 | 0.909 | 0.909 | 0.909 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 3566 | 752 | 145 | pcph |

## Estimation of V12 Merge Areas

$L_{EQ}$ = (Equation 13-6 or 13-7)

$P_{FM}$ = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 3566 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{FO}$ | 4318 | 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, $v_{12A}$ = 3566 (Equation 13-15, 13-16, 13-18, or 13-19)

## Flow Entering Merge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{R12}$ | 4318 | 4600 | No |

## Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 31.6 pc/mi/ln

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

## Speed Estimation

| | | |
|---|---|---|
| Intermediate speed variable, | $M_S$ = 0.533 | |
| Space mean speed in ramp influence area, | $S_R$ = 56.5 | mph |
| Space mean speed in outer lanes, | $S_0$ = N/A | mph |
| Space mean speed for all vehicles, | $S$ = 56.5 | mph |

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 8/21/2015 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Eastbound |
| From/To: | East of Jedburg |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2019 Opening Year |
| Description: | 171001612 - Build |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 3533 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 981 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 2159 | pc/h/ln |

## Speed Inputs and Adjustments

| | | |
|---|---|---|
| Lane width | 12.0 | ft |
| Right-side lateral clearance | 6.0 | ft |
| Total ramp density, TRD | 1.17 | 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 | 3.7 | mi/h |
| Free-flow speed, FFS | 71.7 | mi/h |

## LOS and Performance Measures

| | | |
|---|---|---|
| Flow rate, vp | 2159 | pc/h/ln |
| Free-flow speed, FFS | 71.7 | mi/h |
| Average passenger-car speed, S | 59.3 | mi/h |
| Number of lanes, N | 2 | |
| Density, D | 36.4 | pc/mi/ln |
| Level of service, LOS | E | |

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 8/21/2015 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Westbound |
| From/To: | East of Jedburg |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2019 Opening Year |
| Description: | 171001612 - Build |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 3336 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 927 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 2039 | 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 | 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 | 4.1 | mi/h |
| Free-flow speed, FFS | 71.3 | mi/h |

## LOS and Performance Measures

| | | |
|---|---|---|
| Flow rate, vp | 2039 | pc/h/ln |
| Free-flow speed, FFS | 71.3 | mi/h |
| Average passenger-car speed, S | 61.8 | mi/h |
| Number of lanes, N | 2 | |
| Density, D | 33.0 | pc/mi/ln |
| Level of service, LOS | D | |

HCS 2010: Freeway Merge and Diverge Segments Release 6.60

Phone: Fax:
E-mail:

## Diverge Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency/Co.: | Stantec |
| Date performed: | 8/21/2015 |
| Analysis time period: | 3:00 - 4:00 PM |
| Freeway/Dir of Travel: | I-26 Westbound |
| Junction: | Jedburg Off-Ramp |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2019 Opening Year |
| Description: | 171001612 - Build |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Diverge | |
| Number of lanes in freeway | 2 | |
| Free-flow speed on freeway | 71.3 | mph |
| Volume on freeway | 3336 | 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 | 239 | vph |
| Length of first accel/decel lane | 750 | ft |
| Length of second accel/decel lane | | ft |

## Adjacent Ramp Data (if one exists)

| | | |
|---|---|---|
| Does adjacent ramp exist? | Yes | |
| Volume on adjacent ramp | 575 | vph |
| Position of adjacent ramp | Downstream | |
| 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) | 3336 | 239 | 575 | vph |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | |
| Peak 15-min volume, v15 | 927 | 66 | 160 | v |
| Trucks and buses | 20 | 20 | 20 | % |
| Recreational vehicles | 0 | 0 | 0 | % |
| Terrain type: | Level | Level | Level | |
| Grade | 0.00 % | 0.00 % | 0.00 % | |
| Length | 0.00 mi | 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 | 0.909 | 0.909 | 0.909 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 4077 | 292 | 703 | pcph |

## Estimation of V12 Diverge Areas

$L_{EQ}$ = (Equation 13-12 or 13-13)

$P_{FD}$ = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 4077 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{Fi} = v_F$ | 4077 | 4800 | No |
| $v_{FO} = v_F - v_R$ | 3785 | 4800 | No |
| $v_R$ | 292 | 2000 | 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, $v_{12A}$ = 4077 (Equation 13-15, 13-16, 13-18, or 13-19)

## Flow Entering Diverge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{12}$ | 4077 | 4400 | No |

## Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 32.6 pc/mi/ln

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

## Speed Estimation

| | | |
|---|---|---|
| Intermediate speed variable, | $D_S$ = 0.454 | |
| Space mean speed in ramp influence area, | $S_R$ = 58.0 | mph |
| Space mean speed in outer lanes, | $S_0$ = N/A | mph |
| Space mean speed for all vehicles, | $S$ = 58.0 | mph |

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 8/21/2015 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Westbound |
| From/To: | Jedburg Interchange |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2019 Opening Year |
| Description: | 171001612 - Build |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 3097 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 860 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 1893 | 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 | 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 | 4.1 | mi/h |
| Free-flow speed, FFS | 71.3 | mi/h |

## LOS and Performance Measures

| | | |
|---|---|---|
| Flow rate, vp | 1893 | pc/h/ln |
| Free-flow speed, FFS | 71.3 | mi/h |
| Average passenger-car speed, S | 64.4 | mi/h |
| Number of lanes, N | 2 | |
| Density, D | 29.4 | pc/mi/ln |
| Level of service, LOS | D | |

Phone: Fax:
E-mail:

## Diverge Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency/Co.: | Stantec |
| Date performed: | 8/21/2015 |
| Analysis time period: | 3:00 - 4:00 PM |
| Freeway/Dir of Travel: | I-26 Westbound |
| Junction: | Jedburg Loop Off-Ramp |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2019 Opening Year |
| Description: | 171001612 - Build |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Diverge | |
| Number of lanes in freeway | 2 | |
| Free-flow speed on freeway | 71.3 | mph |
| Volume on freeway | 3097 | 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 | 575 | vph |
| Length of first accel/decel lane | 750 | ft |
| Length of second accel/decel lane | | ft |

## Adjacent Ramp Data (if one exists)

| | | |
|---|---|---|
| Does adjacent ramp exist? | Yes | |
| Volume on adjacent ramp | 239 | 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) | 3097 | | 575 | | 239 | | vph |
| Peak-hour factor, PHF | 0.90 | | 0.90 | | 0.90 | | |
| Peak 15-min volume, v15 | 860 | | 160 | | 66 | | v |
| Trucks and buses | 20 | | 20 | | 20 | | % |
| Recreational vehicles | 0 | | 0 | | 0 | | % |
| Terrain type: | Level | | Level | | Level | | |
| Grade | 0.00 | % | 0.00 | % | 0.00 | % | |
| Length | 0.00 | mi | 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 | 0.909 | 0.909 | 0.909 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 3785 | 703 | 292 | pcph |

## Estimation of V12 Diverge Areas

$L_{EQ}$ = (Equation 13-12 or 13-13)

$P_{FD}$ = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3785 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{Fi} = v_F$ | 3785 | 4800 | No |
| $v_{FO} = v_F - v_R$ | 3082 | 4800 | No |
| $v_R$ | 703 | 2000 | 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, $v_{12A}$ = 3785 (Equation 13-15, 13-16, 13-18, or 13-19)

## Flow Entering Diverge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{12}$ | 3785 | 4400 | No |

## Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, L_{12}$ = 30.1 pc/mi/ln

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

## Speed Estimation

Intermediate speed variable, $D_S$ = 0.491

Space mean speed in ramp influence area, $S_R$ = 56.9 mph

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

Space mean speed for all vehicles, $S$ = 56.9 mph

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 8/21/2015 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Westbound |
| From/To: | Jedburg Loop Ramp to On-Ramp |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2019 Opening Year |
| Description: | 171001612 - Build |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 2522 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 701 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| 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 | 1.33 | 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 | 4.1 | mi/h |
| Free-flow speed, FFS | 71.3 | mi/h |

## LOS and Performance Measures

| | | |
|---|---|---|
| Flow rate, vp | 1541 | pc/h/ln |
| Free-flow speed, FFS | 71.3 | mi/h |
| Average passenger-car speed, S | 68.7 | mi/h |
| Number of lanes, N | 2 | |
| Density, D | 22.4 | pc/mi/ln |
| Level of service, LOS | C | |

Phone: Fax:
E-mail:

## Merge Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency/Co.: | Stantec |
| Date performed: | 8/21/2015 |
| Analysis time period: | 3:00 - 4:00 PM |
| Freeway/Dir of Travel: | I-26 Westbound |
| Junction: | Jedburg On-Ramp |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2019 Opening Year |
| Description: | 171001612 - Build |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Merge | |
| Number of lanes in freeway | 2 | |
| Free-flow speed on freeway | 71.3 | mph |
| Volume on freeway | 2522 | 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 | 96 | vph |
| Length of first accel/decel lane | 1300 | ft |
| Length of second accel/decel lane | | ft |

## Adjacent Ramp Data (if one exists)

| | | |
|---|---|---|
| Does adjacent ramp exist? | Yes | |
| Volume on adjacent Ramp | 575 | vph |
| Position of adjacent Ramp | Upstream | |
| Type of adjacent Ramp | Off | |
| Distance to adjacent Ramp | 900 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | Ramp | Adjacent Ramp | |
|---|---|---|---|---|
| Volume, V (vph) | 2522 | 96 | 575 | vph |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | |
| Peak 15-min volume, v15 | 701 | 27 | 160 | v |
| Trucks and buses | 20 | 20 | 20 | % |
| 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 | 0.909 | 0.909 | 0.909 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 3082 | 117 | 703 | pcph |

## Estimation of V12 Merge Areas

$L_{EQ}$ = (Equation 13-6 or 13-7)

$P_{FM}$ = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 3082 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{FO}$ | 3199 | 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, $v_{12A}$ = 3082 (Equation 13-15, 13-16, 13-18, or 13-19)

## Flow Entering Merge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{R12}$ | 3199 | 4600 | No |

## Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 22.2 pc/mi/ln

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

## Speed Estimation

Intermediate speed variable, $M_S$ = 0.326

Space mean speed in ramp influence area, $S_R$ = 61.8 mph

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

Space mean speed for all vehicles, $S$ = 61.8 mph

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 8/21/2015 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Westbound |
| From/To: | Jedburg to New Interchange |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2019 Opening Year |
| Description: | 171001612 - Build |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 2618 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 727 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 1600 | 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 | 1600 | pc/h/ln |
| Free-flow speed, FFS | 72.6 | mi/h |
| Average passenger-car speed, S | 71.0 | mi/h |
| Number of lanes, N | 2 | |
| Density, D | 22.5 | pc/mi/ln |
| Level of service, LOS | C | |

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 8/21/2015 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Westbound |
| From/To: | New Interchange 1 Off Ramp |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2019 Opening Year |
| Description: | 171001612 - Build |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 2618 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 727 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 1067 | 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 | 1067 | 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 | |

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 8/21/2015 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Westbound |
| From/To: | New Interchange 2 Off Ramp |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2019 Opening Year |
| Description: | 171001612 - Build |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 2618 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 727 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 800 | 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 | 4 | |
| Free-flow speed: | Base | |
| FFS 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 | 800 | pc/h/ln |
| Free-flow speed, FFS | 72.6 | mi/h |
| Average passenger-car speed, S | 75.0 | mi/h |
| Number of lanes, N | 4 | |
| Density, D | 10.7 | pc/mi/ln |
| Level of service, LOS | A | |

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 8/21/2015 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Westbound |
| From/To: | New Interchange |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2019 Opening Year |
| Description: | 171001612 - Build |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 2531 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 703 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 1547 | 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 | 1547 | pc/h/ln |
| Free-flow speed, FFS | 72.6 | 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 | |

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 8/21/2015 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Westbound |
| From/To: | New Interchange On Ramp |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2019 Opening Year |
| Description: | 171001612 - Build |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 2667 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 741 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 1087 | 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 | 1087 | 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 | 14.5 | pc/mi/ln |
| Level of service, LOS | B | |

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 8/21/2015 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Westbound |
| From/To: | New Interchange to SC 27 |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2019 Opening Year |
| Description: | 171001612 - Build |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 2667 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 741 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 1630 | 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 | 1630 | pc/h/ln |
| Free-flow speed, FFS | 73.1 | mi/h |
| Average passenger-car speed, S | 70.6 | mi/h |
| Number of lanes, N | 2 | |
| Density, D | 23.1 | pc/mi/ln |
| Level of service, LOS | C | |

Phone: Fax:
E-mail:

## Diverge Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency/Co.: | Stantec |
| Date performed: | 8/21/2015 |
| Analysis time period: | 3:00 - 4:00 PM |
| Freeway/Dir of Travel: | I-26 Westbound |
| Junction: | SC 27 Off-Ramp |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2019 Opening Year |
| Description: | 171001612 - Build |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Diverge | |
| Number of lanes in freeway | 2 | |
| Free-flow speed on freeway | 73.1 | mph |
| Volume on freeway | 2667 | 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 | 411 | 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 | 97 | vph |
| Position of adjacent ramp | Downstream | |
| Type of adjacent ramp | On | |
| Distance to adjacent ramp | 2175 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | | Ramp | | Adjacent Ramp | | |
|---|---|---|---|---|---|---|---|
| Volume, V (vph) | 2667 | | 411 | | 97 | | vph |
| Peak-hour factor, PHF | 0.90 | | 0.90 | | 0.90 | | |
| Peak 15-min volume, v15 | 741 | | 114 | | 27 | | v |
| Trucks and buses | 20 | | 20 | | 20 | | % |
| Recreational vehicles | 0 | | 0 | | 0 | | % |
| Terrain type: | Level | | Level | | Level | | |
| Grade | 0.00 | % | 0.00 | % | 0.00 | % | |
| Length | 0.00 | mi | 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 | 0.909 | 0.909 | 0.909 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 3260 | 502 | 119 | pcph |

## Estimation of V12 Diverge Areas

$L_{EQ}$ = (Equation 13-12 or 13-13)

$P_{FD}$ = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3260 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{Fi} = v_F$ | 3260 | 4800 | No |
| $v_{FO} = v_F - v_R$ | 2758 | 4800 | No |
| $v_R$ | 502 | 2000 | 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, $v_{12A}$ = 3260 (Equation 13-15, 13-16, 13-18, or 13-19)

## Flow Entering Diverge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{12}$ | 3260 | 4400 | No |

## Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\ v_R - 0.009\ L_D$ = 27.8 pc/mi/ln

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

## Speed Estimation

Intermediate speed variable, $D_S$ = 0.473

Space mean speed in ramp influence area, $S_R$ = 58.4 mph

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

Space mean speed for all vehicles, $S$ = 58.4 mph

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 8/21/2015 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Westbound |
| From/To: | SC 27 Interchange |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2019 Opening Year |
| Description: | 171001612 - Build |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 2256 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 627 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 1379 | 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 | 1379 | pc/h/ln |
| Free-flow speed, FFS | 73.1 | mi/h |
| Average passenger-car speed, S | 73.4 | mi/h |
| Number of lanes, N | 2 | |
| Density, D | 18.8 | pc/mi/ln |
| Level of service, LOS | C | |

Phone: Fax:
E-mail:

## Merge Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency/Co.: | Stantec |
| Date performed: | 8/21/2015 |
| Analysis time period: | 3:00 - 4:00 PM |
| Freeway/Dir of Travel: | I-26 Westbound |
| Junction: | SC 27 On-Ramp |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2019 Opening Year |
| Description: | 171001612 - Build |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Merge | |
| Number of lanes in freeway | 2 | |
| Free-flow speed on freeway | 73.1 | 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 | 97 | vph |
| Length of first accel/decel lane | 925 | ft |
| Length of second accel/decel lane | | ft |

## Adjacent Ramp Data (if one exists)

| | | |
|---|---|---|
| Does adjacent ramp exist? | Yes | |
| Volume on adjacent Ramp | 411 | vph |
| Position of adjacent Ramp | Upstream | |
| Type of adjacent Ramp | Off | |
| Distance to adjacent Ramp | 2175 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | Ramp | Adjacent Ramp | |
|---|---|---|---|---|
| Volume, V (vph) | 2256 | 97 | 411 | vph |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | |
| Peak 15-min volume, v15 | 627 | 27 | 114 | v |
| Trucks and buses | 20 | 20 | 20 | % |
| 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 | 0.909 | 0.909 | 0.909 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 2757 | 119 | 502 | pcph |

## Estimation of V12 Merge Areas

$L_{EQ}$ = (Equation 13-6 or 13-7)

$P_{FM}$ = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2757 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{FO}$ | 2876 | 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, $v_{12A}$ = 2757 (Equation 13-15, 13-16, 13-18, or 13-19)

## Flow Entering Merge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{R12}$ | 2876 | 4600 | No |

## Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 22.1 pc/mi/ln

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

## Speed Estimation

| | | |
|---|---|---|
| Intermediate speed variable, | $M_S$ = 0.325 | |
| Space mean speed in ramp influence area, | $S_R$ = 63.0 | mph |
| Space mean speed in outer lanes, | $S_0$ = N/A | mph |
| Space mean speed for all vehicles, | $S$ = 63.0 | mph |

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 8/21/2015 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Westbound |
| From/To: | West of SC 27 |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2019 Opening Year |
| Description: | 171001612 - Build |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 2353 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 654 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 1438 | pc/h/ln |

## Speed Inputs and Adjustments

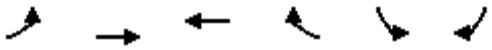
| | | |
|---|---|---|
| Lane width | 12.0 | ft |
| Right-side lateral clearance | 6.0 | ft |
| Total ramp density, TRD | 0.00 | ramps/mi |
| Number of lanes, N | 2 | |
| Free-flow speed: | Base | |
| FFS or BFFS | 75.4 | mi/h |
| Lane width adjustment, fLW | 0.0 | mi/h |
| Lateral clearance adjustment, 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 | 1438 | pc/h/ln |
| Free-flow speed, FFS | 75.4 | 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 | |

# Appendix E

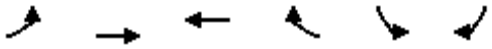
# 2019 Intersection Analysis Worksheets



| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 114 | 150 | 245 | 167 | 225 | 213 |
| Future Volume (vph) | 114 | 150 | 245 | 167 | 225 | 213 |
| Turn Type | pm+pt | NA | NA | pm+ov | Prot | pm+ov |
| Protected Phases | 5 | 2 | 6 | 4 | 4 | 5 |
| Permitted Phases | 2 | | | 6 | | 4 |
| Detector Phase | 5 | 2 | 6 | 4 | 4 | 5 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| Minimum Split (s) | 15.0 | 22.0 | 22.0 | 22.0 | 22.0 | 15.0 |
| Total Split (s) | 15.0 | 38.0 | 23.0 | 22.0 | 22.0 | 15.0 |
| Total Split (%) | 25.0% | 63.3% | 38.3% | 36.7% | 36.7% | 25.0% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | | Lag | | | Lead |
| Lead-Lag Optimize? | | | | | | |
| Recall Mode | None | Max | Max | Min | Min | None |
| Act Effct Green (s) | 32.1 | 32.1 | 18.4 | 37.8 | 13.4 | 27.0 |
| Actuated g/C Ratio | 0.56 | 0.56 | 0.32 | 0.66 | 0.23 | 0.47 |
| v/c Ratio | 0.26 | 0.19 | 0.54 | 0.20 | 0.71 | 0.31 |
| Control Delay | 8.4 | 7.7 | 22.1 | 1.3 | 32.6 | 2.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 8.4 | 7.7 | 22.1 | 1.3 | 32.6 | 2.5 |
| LOS | A | A | C | A | C | A |
| Approach Delay | | 8.0 | 13.7 | | 18.0 | |
| Approach LOS | | A | B | | B | |

| Intersection Summary | |
|---|---|
| Cycle Length: 60 | |
| Actuated Cycle Length: 57.5 | |
| Natural Cycle: 60 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.71 | |
| Intersection Signal Delay: 14.0 | Intersection LOS: B |
| Intersection Capacity Utilization 46.7% | ICU Level of Service A |
| Analysis Period (min) 15 | |

Splits and Phases: 101: US 78 & SC 27/Ridgeville Road



| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 114 | 150 | 245 | 167 | 225 | 213 |
| Future Volume (veh/h) | 114 | 150 | 245 | 167 | 225 | 213 |
| Number | 5 | 2 | 6 | 16 | 7 | 14 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | | 1.00 | 1.00 | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1583 | 1583 | 1583 | 1583 | 1583 | 1583 |
| Adj Flow Rate, veh/h | 127 | 167 | 272 | 186 | 250 | 237 |
| Adj No. of Lanes | 1 | 1 | 1 | 1 | 1 | 1 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | 20 | 20 | 20 | 20 | 20 | 20 |
| Cap, veh/h | 452 | 912 | 627 | 813 | 314 | 377 |
| Arrive On Green | 0.07 | 0.58 | 0.40 | 0.40 | 0.21 | 0.21 |
| Sat Flow, veh/h | 1508 | 1583 | 1583 | 1346 | 1508 | 1346 |
| Grp Volume(v), veh/h | 127 | 167 | 272 | 186 | 250 | 237 |
| Grp Sat Flow(s),veh/h/ln | 1508 | 1583 | 1583 | 1346 | 1508 | 1346 |
| Q Serve(g_s), s | 2.5 | 2.8 | 7.0 | 3.5 | 8.7 | 8.6 |
| Cycle Q Clear(g_c), s | 2.5 | 2.8 | 7.0 | 3.5 | 8.7 | 8.6 |
| Prop In Lane | 1.00 | | | 1.00 | 1.00 | 1.00 |
| Lane Grp Cap(c), veh/h | 452 | 912 | 627 | 813 | 314 | 377 |
| V/C Ratio(X) | 0.28 | 0.18 | 0.43 | 0.23 | 0.80 | 0.63 |
| Avail Cap(c_a), veh/h | 588 | 912 | 627 | 813 | 434 | 484 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 8.3 | 5.6 | 12.2 | 5.0 | 20.9 | 17.5 |
| Incr Delay (d2), s/veh | 0.3 | 0.4 | 2.2 | 0.7 | 7.0 | 1.7 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(95%),veh/ln | 1.9 | 2.4 | 6.1 | 3.8 | 7.6 | 10.6 |
| LnGrp Delay(d),s/veh | 8.7 | 6.0 | 14.4 | 5.7 | 27.8 | 19.2 |
| LnGrp LOS | A | A | B | A | C | B |
| Approach Vol, veh/h | | 294 | 458 | | 487 | |
| Approach Delay, s/veh | | 7.2 | 10.9 | | 23.6 | |
| Approach LOS | | A | B | | C | |

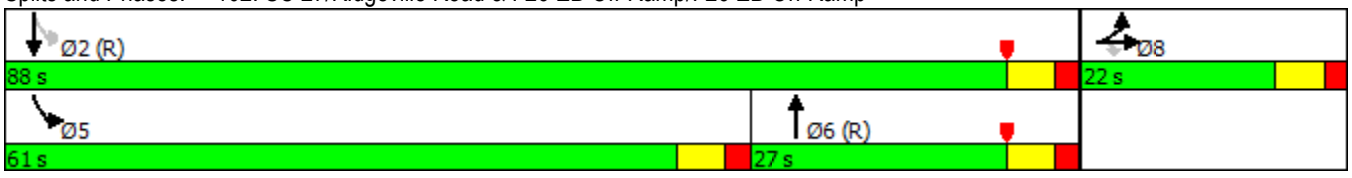
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | 5 | 6 | | |
| Phs Duration (G+Y+Rc), s | | 38.0 | | 17.6 | 10.0 | 28.0 | | |
| Change Period (Y+Rc), s | | 6.0 | | 6.0 | 6.0 | 6.0 | | |
| Max Green Setting (Gmax), s | | 32.0 | | 16.0 | 9.0 | 17.0 | | |
| Max Q Clear Time (g_c+I1), s | | 4.8 | | 10.7 | 4.5 | 9.0 | | |
| Green Ext Time (p_c), s | | 8.3 | | 0.8 | 0.1 | 3.9 | | |

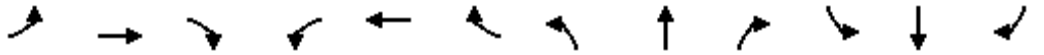
| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 15.0 |
| HCM 2010 LOS | B |

| Lane Group | EBT | EBR | NBT | SBL | SBT |
|---|---|---|---|---|---|
| Lane Configurations | | | | | |
| Traffic Volume (vph) | 5 | 64 | 168 | 791 | 374 |
| Future Volume (vph) | 5 | 64 | 168 | 791 | 374 |
| Turn Type | NA | Perm | NA | pm+pt | NA |
| Protected Phases | 8 | | 6 | 5 | 2 |
| Permitted Phases | | 8 | | 2 | |
| Detector Phase | 8 | 8 | 6 | 5 | 2 |
| Switch Phase | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| Minimum Split (s) | 22.0 | 22.0 | 22.0 | 15.0 | 22.0 |
| Total Split (s) | 22.0 | 22.0 | 27.0 | 61.0 | 88.0 |
| Total Split (%) | 20.0% | 20.0% | 24.5% | 55.5% | 80.0% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | | | Lag | Lead | |
| Lead-Lag Optimize? | | | | | |
| Recall Mode | None | None | C-Min | None | C-Min |
| Act Effct Green (s) | 9.6 | 9.6 | 21.0 | 90.7 | 91.9 |
| Actuated g/C Ratio | 0.09 | 0.09 | 0.19 | 0.82 | 0.84 |
| v/c Ratio | 0.44 | 0.36 | 1.03 | 0.94 | 0.31 |
| Control Delay | 56.4 | 11.4 | 100.3 | 22.6 | 3.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 56.4 | 11.4 | 100.3 | 22.6 | 3.5 |
| LOS | E | B | F | C | A |
| Approach Delay | 32.7 | | 100.3 | | 16.5 |
| Approach LOS | C | | F | | B |

| Intersection Summary | |
|---|---|
| Cycle Length: 110 | |
| Actuated Cycle Length: 110 | |
| Offset: 34 (31%), Referenced to phase 2:SBTL and 6:NBT, Start of Yellow | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.03 | |
| Intersection Signal Delay: 32.8 | Intersection LOS: C |
| Intersection Capacity Utilization 80.4% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 102: SC 27/Ridgeville Road & I-26 EB Off-Ramp/I-26 EB On-Ramp





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 52 | 5 | 64 | 0 | 0 | 0 | 0 | 168 | 113 | 791 | 374 | 0 |
| Future Volume (veh/h) | 52 | 5 | 64 | 0 | 0 | 0 | 0 | 168 | 113 | 791 | 374 | 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 | 1881 | 1630 | 1568 | | | | 0 | 1568 | 1881 | 1583 | 1583 | 0 |
| Adj Flow Rate, veh/h | 58 | 6 | 71 | | | | 0 | 187 | 126 | 879 | 416 | 0 |
| Adj No. of Lanes | 0 | 1 | 1 | | | | 0 | 1 | 0 | 1 | 1 | 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, % | 20 | 20 | 20 | | | | 0 | 20 | 20 | 20 | 20 | 0 |
| Cap, veh/h | 101 | 10 | 95 | | | | 0 | 232 | 156 | 878 | 1298 | 0 |
| Arrive On Green | 0.07 | 0.07 | 0.07 | | | | 0.00 | 0.26 | 0.26 | 0.67 | 1.00 | 0.00 |
| Sat Flow, veh/h | 1413 | 146 | 1332 | | | | 0 | 874 | 589 | 1508 | 1583 | 0 |
| Grp Volume(v), veh/h | 64 | 0 | 71 | | | | 0 | 0 | 313 | 879 | 416 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1560 | 0 | 1332 | | | | 0 | 0 | 1464 | 1508 | 1583 | 0 |
| Q Serve(g_s), s | 4.4 | 0.0 | 5.7 | | | | 0.0 | 0.0 | 22.0 | 55.0 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 4.4 | 0.0 | 5.7 | | | | 0.0 | 0.0 | 22.0 | 55.0 | 0.0 | 0.0 |
| Prop In Lane | 0.91 | | 1.00 | | | | 0.00 | | 0.40 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 111 | 0 | 95 | | | | 0 | 0 | 388 | 878 | 1298 | 0 |
| V/C Ratio(X) | 0.57 | 0.00 | 0.75 | | | | 0.00 | 0.00 | 0.81 | 1.00 | 0.32 | 0.00 |
| Avail Cap(c_a), veh/h | 227 | 0 | 194 | | | | 0 | 0 | 388 | 878 | 1298 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.33 | 1.33 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 0.00 | 1.00 | 0.26 | 0.26 | 0.00 |
| Uniform Delay (d), s/veh | 49.5 | 0.0 | 50.1 | | | | 0.0 | 0.0 | 37.8 | 10.9 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 4.6 | 0.0 | 11.0 | | | | 0.0 | 0.0 | 16.3 | 15.6 | 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(95%),veh/ln | 3.6 | 0.0 | 4.3 | | | | 0.0 | 0.0 | 16.0 | 52.8 | 0.1 | 0.0 |
| LnGrp Delay(d),s/veh | 54.1 | 0.0 | 61.1 | | | | 0.0 | 0.0 | 54.1 | 26.6 | 0.2 | 0.0 |
| LnGrp LOS | D | | E | | | | | | D | F | A | |
| Approach Vol, veh/h | | 135 | | | | | | 313 | | | 1295 | |
| Approach Delay, s/veh | | 57.8 | | | | | | 54.1 | | | 18.1 | |
| Approach LOS | | E | | | | | | D | | | B | |

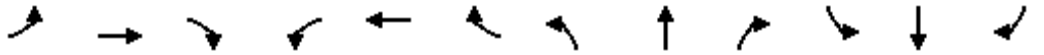
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | | 5 | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | 96.1 | | | 61.0 | 35.1 | | 13.9 |
| Change Period (Y+Rc), s | | 6.0 | | | 6.0 | 6.0 | | 6.0 |
| Max Green Setting (Gmax), s | | 82.0 | | | 55.0 | 21.0 | | 16.0 |
| Max Q Clear Time (g_c+I1), s | | 2.0 | | | 57.0 | 24.0 | | 7.7 |
| Green Ext Time (p_c), s | | 24.2 | | | 0.0 | 0.0 | | 0.2 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 27.6 |
| HCM 2010 LOS | C |

| Lane Group | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 3 | 267 | 40 | 180 | 937 | 190 |
| Future Volume (vph) | 3 | 267 | 40 | 180 | 937 | 190 |
| Turn Type | NA | Perm | Perm | NA | NA | Perm |
| Protected Phases | 4 | | | 6 | 2 | |
| Permitted Phases | | 4 | 6 | | | 2 |
| Detector Phase | 4 | 4 | 6 | 6 | 2 | 2 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| Minimum Split (s) | 22.0 | 22.0 | 22.0 | 22.0 | 22.0 | 22.0 |
| Total Split (s) | 25.0 | 25.0 | 85.0 | 85.0 | 85.0 | 85.0 |
| Total Split (%) | 22.7% | 22.7% | 77.3% | 77.3% | 77.3% | 77.3% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Recall Mode | None | None | C-Min | C-Min | C-Min | C-Min |
| Act Effct Green (s) | 19.2 | 19.2 | 78.8 | 78.8 | 78.8 | 78.8 |
| Actuated g/C Ratio | 0.17 | 0.17 | 0.72 | 0.72 | 0.72 | 0.72 |
| v/c Ratio | 0.90 | 0.62 | 0.25 | 0.18 | 0.93 | 0.21 |
| Control Delay | 77.2 | 11.0 | 8.3 | 2.0 | 29.0 | 1.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 77.2 | 11.0 | 8.3 | 2.0 | 29.0 | 1.5 |
| LOS | E | B | A | A | C | A |
| Approach Delay | 41.7 | | | 3.1 | 24.4 | |
| Approach LOS | D | | | A | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 110 | |
| Actuated Cycle Length: 110 | |
| Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBTL, Start of Yellow | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.93 | |
| Intersection Signal Delay: 26.5 | Intersection LOS: C |
| Intersection Capacity Utilization 80.4% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 103: SC 27/Ridgeville Road & I-26 WB On-Ramp/I-26 WB Off-Ramp



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 228 | 3 | 267 | 40 | 180 | 0 | 0 | 937 | 190 |
| Future Volume (veh/h) | 0 | 0 | 0 | 228 | 3 | 267 | 40 | 180 | 0 | 0 | 937 | 190 |
| 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 | | | | 1881 | 1630 | 1568 | 1583 | 1583 | 0 | 0 | 1568 | 1568 |
| Adj Flow Rate, veh/h | | | | 253 | 3 | 297 | 44 | 200 | 0 | 0 | 1041 | 211 |
| Adj No. of Lanes | | | | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 |
| Peak Hour Factor | | | | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | | | | 20 | 20 | 20 | 20 | 20 | 0 | 0 | 20 | 20 |
| Cap, veh/h | | | | 265 | 3 | 230 | 126 | 1137 | 0 | 0 | 1126 | 957 |
| Arrive On Green | | | | 0.17 | 0.17 | 0.17 | 1.00 | 1.00 | 0.00 | 0.00 | 0.72 | 0.72 |
| Sat Flow, veh/h | | | | 1535 | 18 | 1332 | 376 | 1583 | 0 | 0 | 1568 | 1332 |
| Grp Volume(v), veh/h | | | | 256 | 0 | 297 | 44 | 200 | 0 | 0 | 1041 | 211 |
| Grp Sat Flow(s),veh/h/ln | | | | 1553 | 0 | 1332 | 376 | 1583 | 0 | 0 | 1568 | 1332 |
| Q Serve(g_s), s | | | | 18.0 | 0.0 | 19.0 | 11.9 | 0.0 | 0.0 | 0.0 | 61.3 | 5.8 |
| Cycle Q Clear(g_c), s | | | | 18.0 | 0.0 | 19.0 | 73.2 | 0.0 | 0.0 | 0.0 | 61.3 | 5.8 |
| Prop In Lane | | | | 0.99 | | 1.00 | 1.00 | | 0.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | | | | 268 | 0 | 230 | 126 | 1137 | 0 | 0 | 1126 | 957 |
| V/C Ratio(X) | | | | 0.95 | 0.00 | 1.29 | 0.35 | 0.18 | 0.00 | 0.00 | 0.92 | 0.22 |
| Avail Cap(c_a), veh/h | | | | 268 | 0 | 230 | 126 | 1137 | 0 | 0 | 1126 | 957 |
| HCM Platoon Ratio | | | | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | | | | 1.00 | 0.00 | 1.00 | 0.09 | 0.09 | 0.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | | | | 45.1 | 0.0 | 45.5 | 28.4 | 0.0 | 0.0 | 0.0 | 13.0 | 5.2 |
| Incr Delay (d2), s/veh | | | | 42.4 | 0.0 | 159.3 | 0.7 | 0.0 | 0.0 | 0.0 | 13.9 | 0.5 |
| 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(95%),veh/ln | | | | 16.2 | 0.0 | 30.9 | 1.8 | 0.0 | 0.0 | 0.0 | 39.4 | 4.1 |
| LnGrp Delay(d),s/veh | | | | 87.5 | 0.0 | 204.8 | 29.1 | 0.0 | 0.0 | 0.0 | 26.9 | 5.7 |
| LnGrp LOS | | | | F | | F | C | A | | | C | A |
| Approach Vol, veh/h | | | | | 553 | | | 244 | | | 1252 | |
| Approach Delay, s/veh | | | | | 150.5 | | | 5.3 | | | 23.4 | |
| Approach LOS | | | | | F | | | A | | | C | |

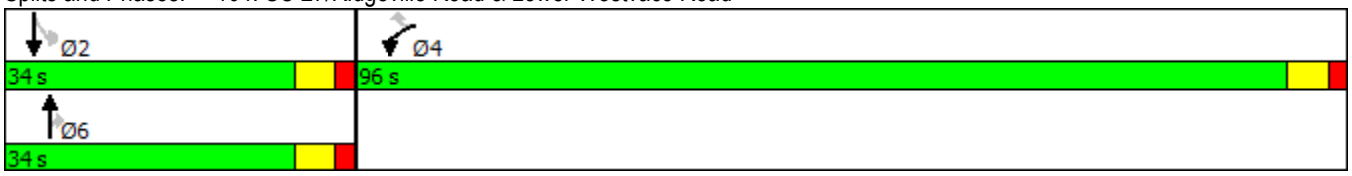
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | | 6 | | |
| Phs Duration (G+Y+Rc), s | | 85.0 | | 25.0 | | 85.0 | | |
| Change Period (Y+Rc), s | | 6.0 | | 6.0 | | 6.0 | | |
| Max Green Setting (Gmax), s | | 79.0 | | 19.0 | | 79.0 | | |
| Max Q Clear Time (g_c+I1), s | | 63.3 | | 21.0 | | 75.2 | | |
| Green Ext Time (p_c), s | | 14.8 | | 0.0 | | 3.6 | | |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 55.5 |
| HCM 2010 LOS | E |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 953 | 10 | 308 | 139 | 10 | 174 |
| Future Volume (vph) | 953 | 10 | 308 | 139 | 10 | 174 |
| Turn Type | Prot | Perm | NA | Perm | Perm | NA |
| Protected Phases | 4 | | 6 | | | 2 |
| Permitted Phases | | 4 | | 6 | 2 | |
| Detector Phase | 4 | 4 | 6 | 6 | 2 | 2 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| Minimum Split (s) | 22.0 | 22.0 | 22.0 | 22.0 | 22.0 | 22.0 |
| Total Split (s) | 96.0 | 96.0 | 34.0 | 34.0 | 34.0 | 34.0 |
| Total Split (%) | 73.8% | 73.8% | 26.2% | 26.2% | 26.2% | 26.2% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Recall Mode | None | None | Max | Max | Max | Max |
| Act Effct Green (s) | 90.0 | 90.0 | 28.0 | 28.0 | 28.0 | 28.0 |
| Actuated g/C Ratio | 0.69 | 0.69 | 0.22 | 0.22 | 0.22 | 0.22 |
| v/c Ratio | 1.02 | 0.01 | 1.01 | 0.38 | 0.16 | 0.57 |
| Control Delay | 53.2 | 4.7 | 101.0 | 11.1 | 48.4 | 53.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 53.2 | 4.7 | 101.0 | 11.1 | 48.4 | 53.1 |
| LOS | D | A | F | B | D | D |
| Approach Delay | 52.7 | | 73.1 | | | 52.8 |
| Approach LOS | D | | E | | | D |

| Intersection Summary | |
|---|---|
| Cycle Length: 130 | |
| Actuated Cycle Length: 130 | |
| Natural Cycle: 130 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.02 | |
| Intersection Signal Delay: 58.4 | Intersection LOS: E |
| Intersection Capacity Utilization 79.0% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 104: SC 27/Ridgeville Road & Lower Westvaco Road



| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 953 | 10 | 308 | 139 | 10 | 174 |
| Future Volume (veh/h) | 953 | 10 | 308 | 139 | 10 | 174 |
| Number | 7 | 14 | 6 | 16 | 5 | 2 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1583 | 1583 | 1583 | 1583 | 1583 | 1583 |
| Adj Flow Rate, veh/h | 1059 | 11 | 342 | 154 | 11 | 193 |
| Adj No. of Lanes | 1 | 1 | 1 | 1 | 1 | 1 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | 20 | 20 | 20 | 20 | 20 | 20 |
| Cap, veh/h | 1044 | 932 | 341 | 290 | 55 | 341 |
| Arrive On Green | 0.69 | 0.69 | 0.22 | 0.22 | 0.22 | 0.22 |
| Sat Flow, veh/h | 1508 | 1346 | 1583 | 1346 | 763 | 1583 |
| Grp Volume(v), veh/h | 1059 | 11 | 342 | 154 | 11 | 193 |
| Grp Sat Flow(s),veh/h/ln | 1508 | 1346 | 1583 | 1346 | 763 | 1583 |
| Q Serve(g_s), s | 90.0 | 0.3 | 28.0 | 13.2 | 0.0 | 14.2 |
| Cycle Q Clear(g_c), s | 90.0 | 0.3 | 28.0 | 13.2 | 28.0 | 14.2 |
| Prop In Lane | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Lane Grp Cap(c), veh/h | 1044 | 932 | 341 | 290 | 55 | 341 |
| V/C Ratio(X) | 1.01 | 0.01 | 1.00 | 0.53 | 0.20 | 0.57 |
| Avail Cap(c_a), veh/h | 1044 | 932 | 341 | 290 | 55 | 341 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 20.0 | 6.2 | 51.0 | 45.2 | 65.0 | 45.6 |
| Incr Delay (d2), s/veh | 31.5 | 0.0 | 49.5 | 6.8 | 7.9 | 6.7 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(95%),veh/ln | 82.7 | 0.2 | 30.4 | 9.3 | 0.9 | 11.1 |
| LnGrp Delay(d),s/veh | 51.5 | 6.2 | 100.5 | 52.0 | 72.9 | 52.2 |
| LnGrp LOS | F | A | F | D | E | D |
| Approach Vol, veh/h | 1070 | | 496 | | | 204 |
| Approach Delay, s/veh | 51.0 | | 85.4 | | | 53.3 |
| Approach LOS | D | | F | | | D |

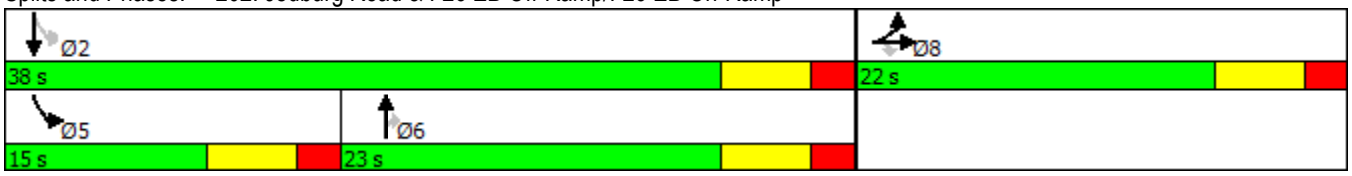
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | | 6 | | |
| Phs Duration (G+Y+Rc), s | | 34.0 | | 96.0 | | 34.0 | | |
| Change Period (Y+Rc), s | | 6.0 | | 6.0 | | 6.0 | | |
| Max Green Setting (Gmax), s | | 28.0 | | 90.0 | | 28.0 | | |
| Max Q Clear Time (g_c+I1), s | | 30.0 | | 92.0 | | 30.0 | | |
| Green Ext Time (p_c), s | | 0.0 | | 0.0 | | 0.0 | | |

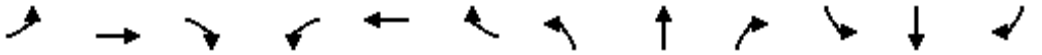
| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 60.9 |
| HCM 2010 LOS | E |

| Lane Group | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 1 | 58 | 314 | 441 | 173 | 819 |
| Future Volume (vph) | 1 | 58 | 314 | 441 | 173 | 819 |
| Turn Type | NA | Perm | NA | Perm | pm+pt | NA |
| Protected Phases | 8 | | 6 | | 5 | 2 |
| Permitted Phases | | 8 | | 6 | 2 | |
| Detector Phase | 8 | 8 | 6 | 6 | 5 | 2 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| Minimum Split (s) | 22.0 | 22.0 | 22.0 | 22.0 | 15.0 | 22.0 |
| Total Split (s) | 22.0 | 22.0 | 23.0 | 23.0 | 15.0 | 38.0 |
| Total Split (%) | 36.7% | 36.7% | 38.3% | 38.3% | 25.0% | 63.3% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | | | Lag | Lag | Lead | |
| Lead-Lag Optimize? | | | | | | |
| Recall Mode | None | None | Max | Max | None | Max |
| Act Effct Green (s) | 7.8 | 7.8 | 21.0 | 21.0 | 35.0 | 36.2 |
| Actuated g/C Ratio | 0.15 | 0.15 | 0.40 | 0.40 | 0.67 | 0.69 |
| v/c Ratio | 0.30 | 0.19 | 0.29 | 0.59 | 0.34 | 0.44 |
| Control Delay | 23.2 | 1.2 | 13.5 | 5.2 | 6.4 | 6.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 23.2 | 1.2 | 13.5 | 5.2 | 6.4 | 6.1 |
| LOS | C | A | B | A | A | A |
| Approach Delay | 12.5 | | 8.7 | | | 6.1 |
| Approach LOS | B | | A | | | A |

| Intersection Summary | |
|---|---|
| Cycle Length: 60 | |
| Actuated Cycle Length: 52.5 | |
| Natural Cycle: 60 | |
| Control Type: Semi Act-Uncoord | |
| Maximum v/c Ratio: 0.59 | |
| Intersection Signal Delay: 7.6 | Intersection LOS: A |
| Intersection Capacity Utilization 55.3% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 202: Jedburg Road & I-26 EB Off-Ramp/I-26 EB On-Ramp





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 60 | 1 | 58 | 0 | 0 | 0 | 0 | 314 | 441 | 173 | 819 | 0 |
| Future Volume (veh/h) | 60 | 1 | 58 | 0 | 0 | 0 | 0 | 314 | 441 | 173 | 819 | 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 | 1583 | 1583 | | | | 0 | 1583 | 1583 | 1583 | 1583 | 0 |
| Adj Flow Rate, veh/h | 67 | 1 | 0 | | | | 0 | 349 | 0 | 192 | 910 | 0 |
| Adj No. of Lanes | 0 | 1 | 1 | | | | 0 | 2 | 1 | 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, % | 20 | 20 | 20 | | | | 0 | 20 | 20 | 20 | 20 | 0 |
| Cap, veh/h | 78 | 1 | 71 | | | | 0 | 1393 | 623 | 644 | 2073 | 0 |
| Arrive On Green | 0.05 | 0.05 | 0.00 | | | | 0.00 | 0.46 | 0.00 | 0.10 | 0.69 | 0.00 |
| Sat Flow, veh/h | 1487 | 22 | 1346 | | | | 0 | 3088 | 1346 | 1508 | 3088 | 0 |
| Grp Volume(v), veh/h | 68 | 0 | 0 | | | | 0 | 349 | 0 | 192 | 910 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1509 | 0 | 1346 | | | | 0 | 1504 | 1346 | 1508 | 1504 | 0 |
| Q Serve(g_s), s | 2.1 | 0.0 | 0.0 | | | | 0.0 | 3.3 | 0.0 | 2.7 | 6.3 | 0.0 |
| Cycle Q Clear(g_c), s | 2.1 | 0.0 | 0.0 | | | | 0.0 | 3.3 | 0.0 | 2.7 | 6.3 | 0.0 |
| Prop In Lane | 0.99 | | 1.00 | | | | 0.00 | | 1.00 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 79 | 0 | 71 | | | | 0 | 1393 | 623 | 644 | 2073 | 0 |
| V/C Ratio(X) | 0.86 | 0.00 | 0.00 | | | | 0.00 | 0.25 | 0.00 | 0.30 | 0.44 | 0.00 |
| Avail Cap(c_a), veh/h | 520 | 0 | 464 | | | | 0 | 1393 | 623 | 790 | 2073 | 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 | 21.8 | 0.0 | 0.0 | | | | 0.0 | 7.6 | 0.0 | 4.6 | 3.2 | 0.0 |
| Incr Delay (d2), s/veh | 21.9 | 0.0 | 0.0 | | | | 0.0 | 0.4 | 0.0 | 0.3 | 0.7 | 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 |
| %ile BackOfQ(95%),veh/ln | 2.4 | 0.0 | 0.0 | | | | 0.0 | 2.6 | 0.0 | 2.0 | 4.9 | 0.0 |
| LnGrp Delay(d),s/veh | 43.7 | 0.0 | 0.0 | | | | 0.0 | 8.0 | 0.0 | 4.8 | 3.9 | 0.0 |
| LnGrp LOS | D | | | | | | | A | | A | A | |
| Approach Vol, veh/h | | 68 | | | | | | 349 | | | 1102 | |
| Approach Delay, s/veh | | 43.7 | | | | | | 8.0 | | | 4.1 | |
| Approach LOS | | D | | | | | | A | | | A | |

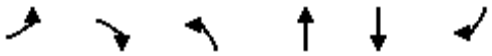
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | | 5 | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | 38.0 | | | 10.5 | 27.5 | | 8.4 |
| Change Period (Y+Rc), s | | 6.0 | | | 6.0 | 6.0 | | 6.0 |
| Max Green Setting (Gmax), s | | 32.0 | | | 9.0 | 17.0 | | 16.0 |
| Max Q Clear Time (g_c+I1), s | | 8.3 | | | 4.7 | 5.3 | | 4.1 |
| Green Ext Time (p_c), s | | 20.0 | | | 0.2 | 10.5 | | 0.1 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 6.7 |
| HCM 2010 LOS | A |

| Lane Group | NBL | NBT | SBT |
|---|---|---|---|
| Lane Configurations | | | |
| Traffic Volume (vph) | 57 | 317 | 417 |
| Future Volume (vph) | 57 | 317 | 417 |
| Turn Type | D.P+P | NA | NA |
| Protected Phases | 1 | Free | 2 |
| Permitted Phases | 2 | | |
| Detector Phase | 1 | | 2 |
| Switch Phase | | | |
| Minimum Initial (s) | 4.0 | | 4.0 |
| Minimum Split (s) | 15.0 | | 22.0 |
| Total Split (s) | 22.0 | | 38.0 |
| Total Split (%) | 36.7% | | 63.3% |
| Yellow Time (s) | 4.0 | | 4.0 |
| All-Red Time (s) | 2.0 | | 2.0 |
| Lost Time Adjust (s) | 0.0 | | 0.0 |
| Total Lost Time (s) | 6.0 | | 6.0 |
| Lead/Lag | Lead | | Lag |
| Lead-Lag Optimize? | | | |
| Recall Mode | None | | Max |
| Act Effct Green (s) | 41.6 | 51.3 | 40.3 |
| Actuated g/C Ratio | 0.81 | 1.00 | 0.79 |
| v/c Ratio | 0.09 | 0.12 | 0.22 |
| Control Delay | 1.0 | 0.1 | 3.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 |
| Total Delay | 1.0 | 0.1 | 3.1 |
| LOS | A | A | A |
| Approach Delay | | 0.2 | 3.1 |
| Approach LOS | | A | A |

| Intersection Summary | |
|---|---|
| Cycle Length: 60 | |
| Actuated Cycle Length: 51.3 | |
| Natural Cycle: 40 | |
| Control Type: Semi Act-Uncoord | |
| Maximum v/c Ratio: 0.22 | |
| Intersection Signal Delay: 1.8 | Intersection LOS: A |
| Intersection Capacity Utilization 53.8% | ICU Level of Service A |
| Analysis Period (min) 15 | |

Splits and Phases: 203: Jedburg Road & I-26 WB On-Ramp



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 0 | 0 | 57 | 317 | 417 | 39 |
| Future Volume (vph) | 0 | 0 | 57 | 317 | 417 | 39 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | | 6.0 | 4.0 | 6.0 | |
| Lane Util. Factor | | | 1.00 | 0.95 | 0.95 | |
| Frt | | | 1.00 | 1.00 | 0.99 | |
| Flt Protected | | | 0.95 | 1.00 | 1.00 | |
| Satd. Flow (prot) | | | 1504 | 3008 | 2970 | |
| Flt Permitted | | | 0.47 | 1.00 | 1.00 | |
| Satd. Flow (perm) | | | 738 | 3008 | 2970 | |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 0 | 0 | 63 | 352 | 463 | 43 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 7 | 0 |
| Lane Group Flow (vph) | 0 | 0 | 63 | 352 | 499 | 0 |
| Turn Type | | | D.P+P | NA | NA | |
| Protected Phases | | | 1 | Free | 2 | |
| Permitted Phases | | | 2 | | | |
| Actuated Green, G (s) | | | 41.6 | 53.6 | 38.0 | |
| Effective Green, g (s) | | | 41.6 | 53.6 | 38.0 | |
| Actuated g/C Ratio | | | 0.78 | 1.00 | 0.71 | |
| Clearance Time (s) | | | 6.0 | | 6.0 | |
| Vehicle Extension (s) | | | 3.0 | | 3.0 | |
| Lane Grp Cap (vph) | | | 624 | 3008 | 2105 | |
| v/s Ratio Prot | | | 0.01 | 0.12 | c0.17 | |
| v/s Ratio Perm | | | 0.07 | | | |
| v/c Ratio | | | 0.10 | 0.12 | 0.24 | |
| Uniform Delay, d1 | | | 1.4 | 0.0 | 2.7 | |
| Progression Factor | | | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | | | 0.1 | 0.1 | 0.3 | |
| Delay (s) | | | 1.5 | 0.1 | 3.0 | |
| Level of Service | | | A | A | A | |
| Approach Delay (s) | 0.0 | | | 0.3 | 3.0 | |
| Approach LOS | A | | | A | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 1.8 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.24 | | |
| Actuated Cycle Length (s) | 53.6 | Sum of lost time (s) | 12.0 |
| Intersection Capacity Utilization | 53.8% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

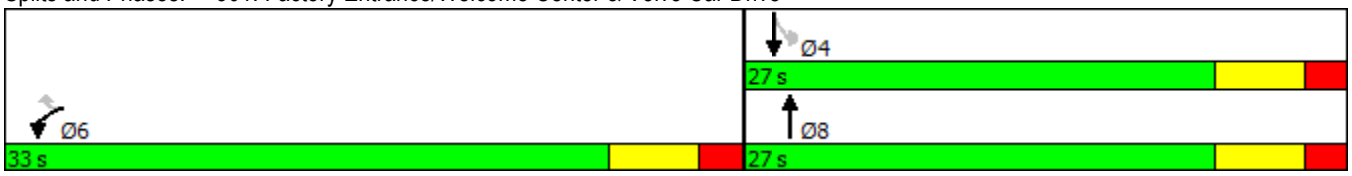
c Critical Lane Group

HCM 2010 analysis expects strict NEMA phasing.

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 100 | 10 | 10 | 900 | 11 | 10 |
| Future Volume (vph) | 100 | 10 | 10 | 900 | 11 | 10 |
| Turn Type | Prot | Perm | NA | Free | Perm | NA |
| Protected Phases | 6 | | 8 | | | 4 |
| Permitted Phases | | 6 | | Free | 4 | |
| Detector Phase | 6 | 6 | 8 | | 4 | 4 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 |
| Minimum Split (s) | 15.0 | 15.0 | 22.0 | | 22.0 | 22.0 |
| Total Split (s) | 33.0 | 33.0 | 27.0 | | 27.0 | 27.0 |
| Total Split (%) | 55.0% | 55.0% | 45.0% | | 45.0% | 45.0% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | | 6.0 | 6.0 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Recall Mode | Min | Min | None | | None | None |
| Act Effct Green (s) | 25.5 | 25.5 | 5.8 | 28.5 | 5.9 | 5.9 |
| Actuated g/C Ratio | 0.89 | 0.89 | 0.20 | 1.00 | 0.21 | 0.21 |
| v/c Ratio | 0.07 | 0.01 | 0.03 | 0.63 | 0.03 | 0.03 |
| Control Delay | 2.5 | 2.3 | 10.5 | 1.9 | 10.5 | 10.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 2.5 | 2.3 | 10.5 | 1.9 | 10.5 | 10.5 |
| LOS | A | A | B | A | B | B |
| Approach Delay | 2.5 | | 2.0 | | | 10.5 |
| Approach LOS | A | | A | | | B |

| Intersection Summary | |
|---|---|
| Cycle Length: 60 | |
| Actuated Cycle Length: 28.5 | |
| Natural Cycle: 40 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.63 | |
| Intersection Signal Delay: 2.2 | Intersection LOS: A |
| Intersection Capacity Utilization 22.8% | ICU Level of Service A |
| Analysis Period (min) 15 | |

Splits and Phases: 301: Factory Entrance/Welcome Center & Volvo Car Drive



| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 100 | 10 | 10 | 900 | 11 | 10 |
| Future Volume (veh/h) | 100 | 10 | 10 | 900 | 11 | 10 |
| Number | 1 | 16 | 8 | 18 | 7 | 4 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 111 | 11 | 11 | 0 | 12 | 11 |
| Adj No. of Lanes | 1 | 1 | 1 | 1 | 1 | 1 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 428 | 382 | 65 | 55 | 475 | 65 |
| Arrive On Green | 0.24 | 0.24 | 0.03 | 0.00 | 0.03 | 0.03 |
| Sat Flow, veh/h | 1774 | 1583 | 1863 | 1583 | 1398 | 1863 |
| Grp Volume(v), veh/h | 111 | 11 | 11 | 0 | 12 | 11 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 1583 | 1863 | 1583 | 1398 | 1863 |
| Q Serve(g_s), s | 0.8 | 0.1 | 0.1 | 0.0 | 0.1 | 0.1 |
| Cycle Q Clear(g_c), s | 0.8 | 0.1 | 0.1 | 0.0 | 0.2 | 0.1 |
| Prop In Lane | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Lane Grp Cap(c), veh/h | 428 | 382 | 65 | 55 | 475 | 65 |
| V/C Ratio(X) | 0.26 | 0.03 | 0.17 | 0.00 | 0.03 | 0.17 |
| Avail Cap(c_a), veh/h | 2889 | 2578 | 2359 | 2005 | 2197 | 2359 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 5.1 | 4.8 | 7.8 | 0.0 | 7.9 | 7.8 |
| Incr Delay (d2), s/veh | 0.3 | 0.0 | 1.2 | 0.0 | 0.0 | 1.2 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(95%),veh/ln | 0.8 | 0.1 | 0.1 | 0.0 | 0.1 | 0.1 |
| LnGrp Delay(d),s/veh | 5.4 | 4.8 | 9.0 | 0.0 | 7.9 | 9.0 |
| LnGrp LOS | A | A | A | | A | A |
| Approach Vol, veh/h | 122 | | 11 | | | 23 |
| Approach Delay, s/veh | 5.4 | | 9.0 | | | 8.4 |
| Approach LOS | A | | A | | | A |

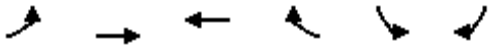
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | | | 4 | | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | | | 6.6 | | 10.0 | | 6.6 |
| Change Period (Y+Rc), s | | | | 6.0 | | 6.0 | | 6.0 |
| Max Green Setting (Gmax), s | | | | 21.0 | | 27.0 | | 21.0 |
| Max Q Clear Time (g_c+I1), s | | | | 2.2 | | 2.8 | | 2.1 |
| Green Ext Time (p_c), s | | | | 0.0 | | 0.3 | | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 6.1 |
| HCM 2010 LOS | A |

| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 114 | 150 | 245 | 167 | 225 | 213 |
| Future Volume (vph) | 114 | 150 | 245 | 167 | 225 | 213 |
| Turn Type | pm+pt | NA | NA | pm+ov | Prot | pm+ov |
| Protected Phases | 5 | 2 | 6 | 4 | 4 | 5 |
| Permitted Phases | 2 | | | 6 | | 4 |
| Detector Phase | 5 | 2 | 6 | 4 | 4 | 5 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| Minimum Split (s) | 15.0 | 22.0 | 22.0 | 22.0 | 22.0 | 15.0 |
| Total Split (s) | 15.0 | 38.0 | 23.0 | 22.0 | 22.0 | 15.0 |
| Total Split (%) | 25.0% | 63.3% | 38.3% | 36.7% | 36.7% | 25.0% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | | Lag | | | Lead |
| Lead-Lag Optimize? | | | | | | |
| Recall Mode | None | Max | Max | None | None | None |
| Act Effct Green (s) | 32.1 | 32.1 | 18.4 | 37.8 | 13.4 | 27.0 |
| Actuated g/C Ratio | 0.56 | 0.56 | 0.32 | 0.66 | 0.23 | 0.47 |
| v/c Ratio | 0.26 | 0.19 | 0.54 | 0.20 | 0.71 | 0.31 |
| Control Delay | 8.4 | 7.7 | 22.1 | 1.3 | 32.6 | 2.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 8.4 | 7.7 | 22.1 | 1.3 | 32.6 | 2.5 |
| LOS | A | A | C | A | C | A |
| Approach Delay | | 8.0 | 13.7 | | 18.0 | |
| Approach LOS | | A | B | | B | |

| Intersection Summary | |
|---|---|
| Cycle Length: 60 | |
| Actuated Cycle Length: 57.5 | |
| Natural Cycle: 60 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.71 | |
| Intersection Signal Delay: 14.0 | Intersection LOS: B |
| Intersection Capacity Utilization 46.7% | ICU Level of Service A |
| Analysis Period (min) 15 | |

Splits and Phases: 101: US 78 & SC 27/Ridgeville Road



| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 114 | 150 | 245 | 167 | 225 | 213 |
| Future Volume (veh/h) | 114 | 150 | 245 | 167 | 225 | 213 |
| Number | 5 | 2 | 6 | 16 | 7 | 14 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | | 1.00 | 1.00 | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1583 | 1583 | 1583 | 1583 | 1583 | 1583 |
| Adj Flow Rate, veh/h | 127 | 167 | 272 | 186 | 250 | 237 |
| Adj No. of Lanes | 1 | 1 | 1 | 1 | 1 | 1 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | 20 | 20 | 20 | 20 | 20 | 20 |
| Cap, veh/h | 452 | 912 | 627 | 813 | 314 | 377 |
| Arrive On Green | 0.07 | 0.58 | 0.40 | 0.40 | 0.21 | 0.21 |
| Sat Flow, veh/h | 1508 | 1583 | 1583 | 1346 | 1508 | 1346 |
| Grp Volume(v), veh/h | 127 | 167 | 272 | 186 | 250 | 237 |
| Grp Sat Flow(s),veh/h/ln | 1508 | 1583 | 1583 | 1346 | 1508 | 1346 |
| Q Serve(g_s), s | 2.5 | 2.8 | 7.0 | 3.5 | 8.7 | 8.6 |
| Cycle Q Clear(g_c), s | 2.5 | 2.8 | 7.0 | 3.5 | 8.7 | 8.6 |
| Prop In Lane | 1.00 | | | 1.00 | 1.00 | 1.00 |
| Lane Grp Cap(c), veh/h | 452 | 912 | 627 | 813 | 314 | 377 |
| V/C Ratio(X) | 0.28 | 0.18 | 0.43 | 0.23 | 0.80 | 0.63 |
| Avail Cap(c_a), veh/h | 588 | 912 | 627 | 813 | 434 | 484 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 8.3 | 5.6 | 12.2 | 5.1 | 20.9 | 17.5 |
| Incr Delay (d2), s/veh | 0.3 | 0.4 | 2.2 | 0.7 | 7.0 | 1.7 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(95%),veh/ln | 1.9 | 2.4 | 6.1 | 3.8 | 7.6 | 10.6 |
| LnGrp Delay(d),s/veh | 8.7 | 6.0 | 14.4 | 5.7 | 27.8 | 19.2 |
| LnGrp LOS | A | A | B | A | C | B |
| Approach Vol, veh/h | | 294 | 458 | | 487 | |
| Approach Delay, s/veh | | 7.2 | 10.9 | | 23.6 | |
| Approach LOS | | A | B | | C | |

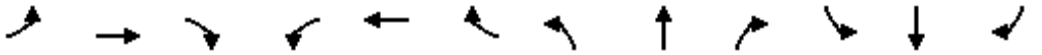
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | 5 | 6 | | |
| Phs Duration (G+Y+Rc), s | | 38.0 | | 17.6 | 10.0 | 28.0 | | |
| Change Period (Y+Rc), s | | 6.0 | | 6.0 | 6.0 | 6.0 | | |
| Max Green Setting (Gmax), s | | 32.0 | | 16.0 | 9.0 | 17.0 | | |
| Max Q Clear Time (g_c+I1), s | | 4.8 | | 10.7 | 4.5 | 9.0 | | |
| Green Ext Time (p_c), s | | 8.3 | | 0.8 | 0.1 | 3.9 | | |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 15.0 |
| HCM 2010 LOS | B |

| Lane Group | EBT | EBR | NBT | SBL | SBT |
|---|---|---|---|---|---|
| Lane Configurations | | | | | |
| Traffic Volume (vph) | 5 | 64 | 168 | 142 | 374 |
| Future Volume (vph) | 5 | 64 | 168 | 142 | 374 |
| Turn Type | NA | Perm | NA | pm+pt | NA |
| Protected Phases | 8 | | 6 | 5 | 2 |
| Permitted Phases | | 8 | | 2 | |
| Detector Phase | 8 | 8 | 6 | 5 | 2 |
| Switch Phase | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| Minimum Split (s) | 22.0 | 22.0 | 22.0 | 15.0 | 22.0 |
| Total Split (s) | 22.0 | 22.0 | 33.0 | 15.0 | 48.0 |
| Total Split (%) | 31.4% | 31.4% | 47.1% | 21.4% | 68.6% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | | | Lag | Lead | |
| Lead-Lag Optimize? | | | | | |
| Recall Mode | None | None | C-Min | None | C-Min |
| Act Effct Green (s) | 7.5 | 7.5 | 39.0 | 52.8 | 54.0 |
| Actuated g/C Ratio | 0.11 | 0.11 | 0.56 | 0.75 | 0.77 |
| v/c Ratio | 0.26 | 0.27 | 0.37 | 0.24 | 0.34 |
| Control Delay | 31.8 | 3.0 | 10.2 | 2.5 | 2.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 31.8 | 3.0 | 10.2 | 2.5 | 2.4 |
| LOS | C | A | B | A | A |
| Approach Delay | 14.3 | | 10.2 | | 2.4 |
| Approach LOS | B | | B | | A |

| Intersection Summary | |
|---|---|
| Cycle Length: 70 | |
| Actuated Cycle Length: 70 | |
| Offset: 58 (83%), Referenced to phase 2:SBTL and 6:NBT, Start of Yellow | |
| Natural Cycle: 60 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.37 | |
| Intersection Signal Delay: 6.2 | Intersection LOS: A |
| Intersection Capacity Utilization 46.3% | ICU Level of Service A |
| Analysis Period (min) 15 | |

Splits and Phases: 102: SC 27/Ridgeville Road & I-26 EB Off-Ramp/I-26 EB On-Ramp



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 36 | 5 | 64 | 0 | 0 | 0 | 0 | 168 | 113 | 142 | 374 | 0 |
| Future Volume (veh/h) | 36 | 5 | 64 | 0 | 0 | 0 | 0 | 168 | 113 | 142 | 374 | 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 | 1881 | 1630 | 1568 | | | | 0 | 1568 | 1881 | 1583 | 1583 | 0 |
| Adj Flow Rate, veh/h | 40 | 6 | 71 | | | | 0 | 187 | 126 | 158 | 416 | 0 |
| Adj No. of Lanes | 0 | 1 | 1 | | | | 0 | 1 | 0 | 1 | 1 | 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, % | 20 | 20 | 20 | | | | 0 | 20 | 20 | 20 | 20 | 0 |
| Cap, veh/h | 102 | 15 | 100 | | | | 0 | 527 | 355 | 647 | 1193 | 0 |
| Arrive On Green | 0.08 | 0.08 | 0.08 | | | | 0.00 | 0.60 | 0.60 | 0.13 | 1.00 | 0.00 |
| Sat Flow, veh/h | 1358 | 204 | 1332 | | | | 0 | 874 | 589 | 1508 | 1583 | 0 |
| Grp Volume(v), veh/h | 46 | 0 | 71 | | | | 0 | 0 | 313 | 158 | 416 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1562 | 0 | 1332 | | | | 0 | 0 | 1464 | 1508 | 1583 | 0 |
| Q Serve(g_s), s | 2.0 | 0.0 | 3.6 | | | | 0.0 | 0.0 | 7.6 | 2.6 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 2.0 | 0.0 | 3.6 | | | | 0.0 | 0.0 | 7.6 | 2.6 | 0.0 | 0.0 |
| Prop In Lane | 0.87 | | 1.00 | | | | 0.00 | | 0.40 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 118 | 0 | 100 | | | | 0 | 0 | 882 | 647 | 1193 | 0 |
| V/C Ratio(X) | 0.39 | 0.00 | 0.71 | | | | 0.00 | 0.00 | 0.35 | 0.24 | 0.35 | 0.00 |
| Avail Cap(c_a), veh/h | 357 | 0 | 305 | | | | 0 | 0 | 882 | 743 | 1193 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 0.00 | 1.00 | 0.95 | 0.95 | 0.00 |
| Uniform Delay (d), s/veh | 30.8 | 0.0 | 31.6 | | | | 0.0 | 0.0 | 7.0 | 4.1 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 2.1 | 0.0 | 8.8 | | | | 0.0 | 0.0 | 1.1 | 0.2 | 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(95%),veh/ln | 1.6 | 0.0 | 2.9 | | | | 0.0 | 0.0 | 6.0 | 1.8 | 0.5 | 0.0 |
| LnGrp Delay(d),s/veh | 33.0 | 0.0 | 40.5 | | | | 0.0 | 0.0 | 8.2 | 4.3 | 0.8 | 0.0 |
| LnGrp LOS | C | | D | | | | | | A | A | A | |
| Approach Vol, veh/h | | 117 | | | | | | 313 | | | 574 | |
| Approach Delay, s/veh | | 37.5 | | | | | | 8.2 | | | 1.7 | |
| Approach LOS | | D | | | | | | A | | | A | |

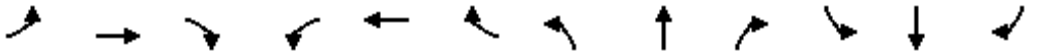
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | | 5 | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | 58.7 | | | 10.6 | 48.2 | | 11.3 |
| Change Period (Y+Rc), s | | 6.0 | | | 6.0 | 6.0 | | 6.0 |
| Max Green Setting (Gmax), s | | 42.0 | | | 9.0 | 27.0 | | 16.0 |
| Max Q Clear Time (g_c+I1), s | | 2.0 | | | 4.6 | 9.6 | | 5.6 |
| Green Ext Time (p_c), s | | 18.6 | | | 0.2 | 10.8 | | 0.2 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 7.9 |
| HCM 2010 LOS | A |

| Lane Group | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 3 | 180 | 40 | 164 | 288 | 54 |
| Future Volume (vph) | 3 | 180 | 40 | 164 | 288 | 54 |
| Turn Type | NA | Perm | Perm | NA | NA | Perm |
| Protected Phases | 4 | | | 6 | 2 | |
| Permitted Phases | | 4 | 6 | | | 2 |
| Detector Phase | 4 | 4 | 6 | 6 | 2 | 2 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| Minimum Split (s) | 22.0 | 22.0 | 22.0 | 22.0 | 22.0 | 22.0 |
| Total Split (s) | 31.0 | 31.0 | 39.0 | 39.0 | 39.0 | 39.0 |
| Total Split (%) | 44.3% | 44.3% | 55.7% | 55.7% | 55.7% | 55.7% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Recall Mode | None | None | C-Min | C-Min | C-Min | C-Min |
| Act Effct Green (s) | 16.3 | 16.3 | 41.7 | 41.7 | 41.7 | 41.7 |
| Actuated g/C Ratio | 0.23 | 0.23 | 0.60 | 0.60 | 0.60 | 0.60 |
| v/c Ratio | 0.67 | 0.43 | 0.08 | 0.19 | 0.34 | 0.07 |
| Control Delay | 32.6 | 6.3 | 6.2 | 6.1 | 9.6 | 2.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 32.6 | 6.3 | 6.2 | 6.1 | 9.6 | 2.9 |
| LOS | C | A | A | A | A | A |
| Approach Delay | 21.0 | | | 6.2 | 8.6 | |
| Approach LOS | C | | | A | A | |

| Intersection Summary | |
|---|---|
| Cycle Length: 70 | |
| Actuated Cycle Length: 70 | |
| Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBTL, Start of Yellow | |
| Natural Cycle: 45 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.67 | |
| Intersection Signal Delay: 13.4 | Intersection LOS: B |
| Intersection Capacity Utilization 46.3% | ICU Level of Service A |
| Analysis Period (min) 15 | |

Splits and Phases: 103: SC 27/Ridgeville Road & I-26 WB On-Ramp/I-26 WB Off-Ramp



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 228 | 3 | 180 | 40 | 164 | 0 | 0 | 288 | 54 |
| Future Volume (veh/h) | 0 | 0 | 0 | 228 | 3 | 180 | 40 | 164 | 0 | 0 | 288 | 54 |
| 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 | | | | 1881 | 1630 | 1568 | 1583 | 1583 | 0 | 0 | 1568 | 1568 |
| Adj Flow Rate, veh/h | | | | 253 | 3 | 200 | 44 | 182 | 0 | 0 | 320 | 60 |
| Adj No. of Lanes | | | | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 |
| Peak Hour Factor | | | | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | | | | 20 | 20 | 20 | 20 | 20 | 0 | 0 | 20 | 20 |
| Cap, veh/h | | | | 315 | 4 | 273 | 550 | 987 | 0 | 0 | 978 | 831 |
| Arrive On Green | | | | 0.20 | 0.20 | 0.20 | 0.21 | 0.21 | 0.00 | 0.00 | 0.62 | 0.62 |
| Sat Flow, veh/h | | | | 1535 | 18 | 1332 | 849 | 1583 | 0 | 0 | 1568 | 1332 |
| Grp Volume(v), veh/h | | | | 256 | 0 | 200 | 44 | 182 | 0 | 0 | 320 | 60 |
| Grp Sat Flow(s),veh/h/ln | | | | 1553 | 0 | 1332 | 849 | 1583 | 0 | 0 | 1568 | 1332 |
| Q Serve(g_s), s | | | | 11.0 | 0.0 | 9.8 | 3.0 | 6.6 | 0.0 | 0.0 | 6.8 | 1.2 |
| Cycle Q Clear(g_c), s | | | | 11.0 | 0.0 | 9.8 | 9.8 | 6.6 | 0.0 | 0.0 | 6.8 | 1.2 |
| Prop In Lane | | | | 0.99 | | 1.00 | 1.00 | | 0.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | | | | 318 | 0 | 273 | 550 | 987 | 0 | 0 | 978 | 831 |
| V/C Ratio(X) | | | | 0.80 | 0.00 | 0.73 | 0.08 | 0.18 | 0.00 | 0.00 | 0.33 | 0.07 |
| Avail Cap(c_a), veh/h | | | | 555 | 0 | 476 | 550 | 987 | 0 | 0 | 978 | 831 |
| HCM Platoon Ratio | | | | 1.00 | 1.00 | 1.00 | 0.33 | 0.33 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | | | | 1.00 | 0.00 | 1.00 | 0.94 | 0.94 | 0.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | | | | 26.5 | 0.0 | 26.0 | 17.2 | 13.1 | 0.0 | 0.0 | 6.2 | 5.2 |
| Incr Delay (d2), s/veh | | | | 4.8 | 0.0 | 3.8 | 0.3 | 0.4 | 0.0 | 0.0 | 0.9 | 0.2 |
| 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(95%),veh/ln | | | | 8.8 | 0.0 | 7.0 | 1.4 | 5.5 | 0.0 | 0.0 | 5.6 | 0.9 |
| LnGrp Delay(d),s/veh | | | | 31.3 | 0.0 | 29.8 | 17.5 | 13.5 | 0.0 | 0.0 | 7.1 | 5.4 |
| LnGrp LOS | | | | C | | C | B | B | | | A | A |
| Approach Vol, veh/h | | | | | 456 | | | 226 | | | 380 | |
| Approach Delay, s/veh | | | | | 30.6 | | | 14.3 | | | 6.8 | |
| Approach LOS | | | | | C | | | B | | | A | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | | 6 | | |
| Phs Duration (G+Y+Rc), s | | 49.7 | | 20.3 | | 49.7 | | |
| Change Period (Y+Rc), s | | 6.0 | | 6.0 | | 6.0 | | |
| Max Green Setting (Gmax), s | | 33.0 | | 25.0 | | 33.0 | | |
| Max Q Clear Time (g_c+I1), s | | 8.8 | | 13.0 | | 11.8 | | |
| Green Ext Time (p_c), s | | 9.8 | | 1.4 | | 9.1 | | |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 18.6 |
| HCM 2010 LOS | B |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 168 | 10 | 308 | 36 | 10 | 174 |
| Future Volume (vph) | 168 | 10 | 308 | 36 | 10 | 174 |
| Turn Type | Prot | Perm | NA | Perm | Perm | NA |
| Protected Phases | 4 | | 6 | | | 2 |
| Permitted Phases | | 4 | | 6 | 2 | |
| Detector Phase | 4 | 4 | 6 | 6 | 2 | 2 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| Minimum Split (s) | 22.0 | 22.0 | 22.0 | 22.0 | 22.0 | 22.0 |
| Total Split (s) | 26.0 | 26.0 | 34.0 | 34.0 | 34.0 | 34.0 |
| Total Split (%) | 43.3% | 43.3% | 56.7% | 56.7% | 56.7% | 56.7% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Recall Mode | None | None | Max | Max | Max | Max |
| Act Effct Green (s) | 11.6 | 11.6 | 32.5 | 32.5 | 32.5 | 32.5 |
| Actuated g/C Ratio | 0.22 | 0.22 | 0.62 | 0.62 | 0.62 | 0.62 |
| v/c Ratio | 0.56 | 0.04 | 0.35 | 0.05 | 0.02 | 0.20 |
| Control Delay | 24.5 | 8.8 | 8.8 | 3.1 | 7.1 | 7.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 24.5 | 8.8 | 8.8 | 3.1 | 7.1 | 7.6 |
| LOS | C | A | A | A | A | A |
| Approach Delay | 23.6 | | 8.2 | | | 7.6 |
| Approach LOS | C | | A | | | A |

| Intersection Summary | |
|---|---|
| Cycle Length: 60 | |
| Actuated Cycle Length: 52.1 | |
| Natural Cycle: 45 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.56 | |
| Intersection Signal Delay: 11.9 | Intersection LOS: B |
| Intersection Capacity Utilization 35.5% | ICU Level of Service A |
| Analysis Period (min) 15 | |

Splits and Phases: 104: SC 27/Ridgeville Road & Lower Westvaco Road

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 168 | 10 | 308 | 36 | 10 | 174 |
| Future Volume (veh/h) | 168 | 10 | 308 | 36 | 10 | 174 |
| Number | 7 | 14 | 6 | 16 | 5 | 2 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1583 | 1583 | 1583 | 1583 | 1583 | 1583 |
| Adj Flow Rate, veh/h | 187 | 11 | 342 | 40 | 11 | 193 |
| Adj No. of Lanes | 1 | 1 | 1 | 1 | 1 | 1 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | 20 | 20 | 20 | 20 | 20 | 20 |
| Cap, veh/h | 239 | 214 | 932 | 792 | 554 | 932 |
| Arrive On Green | 0.16 | 0.16 | 0.59 | 0.59 | 0.59 | 0.59 |
| Sat Flow, veh/h | 1508 | 1346 | 1583 | 1346 | 847 | 1583 |
| Grp Volume(v), veh/h | 187 | 11 | 342 | 40 | 11 | 193 |
| Grp Sat Flow(s),veh/h/ln | 1508 | 1346 | 1583 | 1346 | 847 | 1583 |
| Q Serve(g_s), s | 5.7 | 0.3 | 5.4 | 0.6 | 0.3 | 2.7 |
| Cycle Q Clear(g_c), s | 5.7 | 0.3 | 5.4 | 0.6 | 5.7 | 2.7 |
| Prop In Lane | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Lane Grp Cap(c), veh/h | 239 | 214 | 932 | 792 | 554 | 932 |
| V/C Ratio(X) | 0.78 | 0.05 | 0.37 | 0.05 | 0.02 | 0.21 |
| Avail Cap(c_a), veh/h | 634 | 566 | 932 | 792 | 554 | 932 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 19.2 | 17.0 | 5.1 | 4.1 | 6.6 | 4.6 |
| Incr Delay (d2), s/veh | 5.5 | 0.1 | 1.1 | 0.1 | 0.1 | 0.5 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(95%),veh/ln | 4.9 | 0.2 | 4.6 | 0.4 | 0.2 | 2.4 |
| LnGrp Delay(d),s/veh | 24.7 | 17.1 | 6.2 | 4.3 | 6.7 | 5.1 |
| LnGrp LOS | C | B | A | A | A | A |
| Approach Vol, veh/h | 198 | | 382 | | | 204 |
| Approach Delay, s/veh | 24.3 | | 6.0 | | | 5.2 |
| Approach LOS | C | | A | | | A |

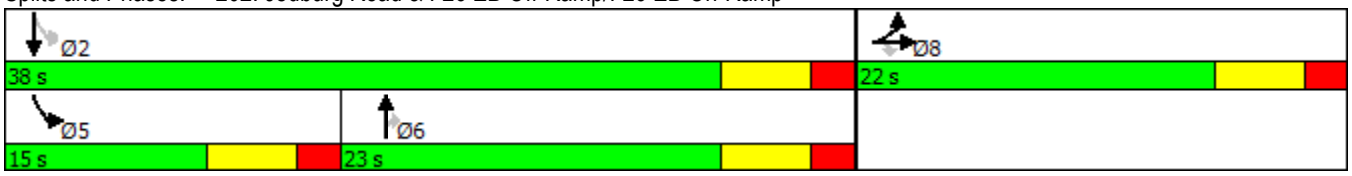
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | | 6 | | |
| Phs Duration (G+Y+Rc), s | | 34.0 | | 13.6 | | 34.0 | | |
| Change Period (Y+Rc), s | | 6.0 | | 6.0 | | 6.0 | | |
| Max Green Setting (Gmax), s | | 28.0 | | 20.0 | | 28.0 | | |
| Max Q Clear Time (g_c+I1), s | | 7.7 | | 7.7 | | 7.4 | | |
| Green Ext Time (p_c), s | | 8.8 | | 0.5 | | 8.9 | | |

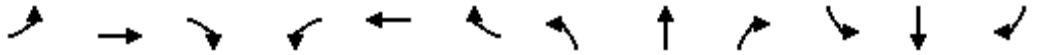
| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 10.4 |
| HCM 2010 LOS | B |

| Lane Group | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 1 | 58 | 314 | 441 | 173 | 819 |
| Future Volume (vph) | 1 | 58 | 314 | 441 | 173 | 819 |
| Turn Type | NA | Perm | NA | Perm | pm+pt | NA |
| Protected Phases | 8 | | 6 | | 5 | 2 |
| Permitted Phases | | 8 | | 6 | 2 | |
| Detector Phase | 8 | 8 | 6 | 6 | 5 | 2 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| Minimum Split (s) | 22.0 | 22.0 | 22.0 | 22.0 | 15.0 | 22.0 |
| Total Split (s) | 22.0 | 22.0 | 23.0 | 23.0 | 15.0 | 38.0 |
| Total Split (%) | 36.7% | 36.7% | 38.3% | 38.3% | 25.0% | 63.3% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | | | Lag | Lag | Lead | |
| Lead-Lag Optimize? | | | | | | |
| Recall Mode | None | None | Max | Max | None | Max |
| Act Effct Green (s) | 7.8 | 7.8 | 21.0 | 21.0 | 35.0 | 36.2 |
| Actuated g/C Ratio | 0.15 | 0.15 | 0.40 | 0.40 | 0.67 | 0.69 |
| v/c Ratio | 0.30 | 0.19 | 0.29 | 0.59 | 0.34 | 0.44 |
| Control Delay | 23.2 | 1.2 | 13.5 | 5.2 | 6.4 | 6.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 23.2 | 1.2 | 13.5 | 5.2 | 6.4 | 6.1 |
| LOS | C | A | B | A | A | A |
| Approach Delay | 12.5 | | 8.7 | | | 6.1 |
| Approach LOS | B | | A | | | A |

| Intersection Summary | |
|---|---|
| Cycle Length: 60 | |
| Actuated Cycle Length: 52.5 | |
| Natural Cycle: 60 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.59 | |
| Intersection Signal Delay: 7.6 | Intersection LOS: A |
| Intersection Capacity Utilization 55.3% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 202: Jedburg Road & I-26 EB Off-Ramp/I-26 EB On-Ramp





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 60 | 1 | 58 | 0 | 0 | 0 | 0 | 314 | 441 | 173 | 819 | 0 |
| Future Volume (veh/h) | 60 | 1 | 58 | 0 | 0 | 0 | 0 | 314 | 441 | 173 | 819 | 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 | 1583 | 1583 | | | | 0 | 1583 | 1583 | 1583 | 1583 | 0 |
| Adj Flow Rate, veh/h | 67 | 1 | 0 | | | | 0 | 349 | 0 | 192 | 910 | 0 |
| Adj No. of Lanes | 0 | 1 | 1 | | | | 0 | 2 | 1 | 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, % | 20 | 20 | 20 | | | | 0 | 20 | 20 | 20 | 20 | 0 |
| Cap, veh/h | 78 | 1 | 71 | | | | 0 | 1393 | 623 | 644 | 2073 | 0 |
| Arrive On Green | 0.05 | 0.05 | 0.00 | | | | 0.00 | 0.46 | 0.00 | 0.10 | 0.69 | 0.00 |
| Sat Flow, veh/h | 1487 | 22 | 1346 | | | | 0 | 3088 | 1346 | 1508 | 3088 | 0 |
| Grp Volume(v), veh/h | 68 | 0 | 0 | | | | 0 | 349 | 0 | 192 | 910 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1509 | 0 | 1346 | | | | 0 | 1504 | 1346 | 1508 | 1504 | 0 |
| Q Serve(g_s), s | 2.1 | 0.0 | 0.0 | | | | 0.0 | 3.3 | 0.0 | 2.7 | 6.3 | 0.0 |
| Cycle Q Clear(g_c), s | 2.1 | 0.0 | 0.0 | | | | 0.0 | 3.3 | 0.0 | 2.7 | 6.3 | 0.0 |
| Prop In Lane | 0.99 | | 1.00 | | | | 0.00 | | 1.00 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 79 | 0 | 71 | | | | 0 | 1393 | 623 | 644 | 2073 | 0 |
| V/C Ratio(X) | 0.86 | 0.00 | 0.00 | | | | 0.00 | 0.25 | 0.00 | 0.30 | 0.44 | 0.00 |
| Avail Cap(c_a), veh/h | 520 | 0 | 464 | | | | 0 | 1393 | 623 | 790 | 2073 | 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 | 21.8 | 0.0 | 0.0 | | | | 0.0 | 7.6 | 0.0 | 4.6 | 3.2 | 0.0 |
| Incr Delay (d2), s/veh | 21.9 | 0.0 | 0.0 | | | | 0.0 | 0.4 | 0.0 | 0.3 | 0.7 | 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 |
| %ile BackOfQ(95%),veh/ln | 2.4 | 0.0 | 0.0 | | | | 0.0 | 2.6 | 0.0 | 2.0 | 4.9 | 0.0 |
| LnGrp Delay(d),s/veh | 43.7 | 0.0 | 0.0 | | | | 0.0 | 8.0 | 0.0 | 4.8 | 3.9 | 0.0 |
| LnGrp LOS | D | | | | | | | A | | A | A | |
| Approach Vol, veh/h | | 68 | | | | | | 349 | | | 1102 | |
| Approach Delay, s/veh | | 43.7 | | | | | | 8.0 | | | 4.1 | |
| Approach LOS | | D | | | | | | A | | | A | |

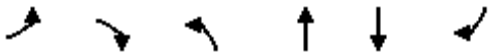
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | | 5 | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | 38.0 | | | 10.5 | 27.5 | | 8.4 |
| Change Period (Y+Rc), s | | 6.0 | | | 6.0 | 6.0 | | 6.0 |
| Max Green Setting (Gmax), s | | 32.0 | | | 9.0 | 17.0 | | 16.0 |
| Max Q Clear Time (g_c+I1), s | | 8.3 | | | 4.7 | 5.3 | | 4.1 |
| Green Ext Time (p_c), s | | 20.0 | | | 0.2 | 10.5 | | 0.1 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 6.7 |
| HCM 2010 LOS | A |

| Lane Group | NBL | NBT | SBT |
|---|---|---|---|
| Lane Configurations | | | |
| Traffic Volume (vph) | 57 | 317 | 417 |
| Future Volume (vph) | 57 | 317 | 417 |
| Turn Type | D.P+P | NA | NA |
| Protected Phases | 1 | Free | 2 |
| Permitted Phases | 2 | | |
| Detector Phase | 1 | | 2 |
| Switch Phase | | | |
| Minimum Initial (s) | 4.0 | | 4.0 |
| Minimum Split (s) | 15.0 | | 22.0 |
| Total Split (s) | 22.0 | | 38.0 |
| Total Split (%) | 36.7% | | 63.3% |
| Yellow Time (s) | 4.0 | | 4.0 |
| All-Red Time (s) | 2.0 | | 2.0 |
| Lost Time Adjust (s) | 0.0 | | 0.0 |
| Total Lost Time (s) | 6.0 | | 6.0 |
| Lead/Lag | Lead | | Lag |
| Lead-Lag Optimize? | | | |
| Recall Mode | None | | Max |
| Act Effct Green (s) | 41.6 | 51.3 | 40.3 |
| Actuated g/C Ratio | 0.81 | 1.00 | 0.79 |
| v/c Ratio | 0.09 | 0.12 | 0.22 |
| Control Delay | 1.0 | 0.1 | 3.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 |
| Total Delay | 1.0 | 0.1 | 3.1 |
| LOS | A | A | A |
| Approach Delay | | 0.2 | 3.1 |
| Approach LOS | | A | A |

| Intersection Summary | |
|---|---|
| Cycle Length: 60 | |
| Actuated Cycle Length: 51.3 | |
| Natural Cycle: 40 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.22 | |
| Intersection Signal Delay: 1.8 | Intersection LOS: A |
| Intersection Capacity Utilization 53.8% | ICU Level of Service A |
| Analysis Period (min) 15 | |

Splits and Phases: 203: Jedburg Road & I-26 WB On-Ramp



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 0 | 0 | 57 | 317 | 417 | 39 |
| Future Volume (vph) | 0 | 0 | 57 | 317 | 417 | 39 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | | 6.0 | 4.0 | 6.0 | |
| Lane Util. Factor | | | 1.00 | 0.95 | 0.95 | |
| Frt | | | 1.00 | 1.00 | 0.99 | |
| Flt Protected | | | 0.95 | 1.00 | 1.00 | |
| Satd. Flow (prot) | | | 1504 | 3008 | 2970 | |
| Flt Permitted | | | 0.47 | 1.00 | 1.00 | |
| Satd. Flow (perm) | | | 738 | 3008 | 2970 | |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 0 | 0 | 63 | 352 | 463 | 43 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 7 | 0 |
| Lane Group Flow (vph) | 0 | 0 | 63 | 352 | 499 | 0 |
| Turn Type | | | D.P+P | NA | NA | |
| Protected Phases | | | 1 | Free | 2 | |
| Permitted Phases | | | 2 | | | |
| Actuated Green, G (s) | | | 41.6 | 53.6 | 38.0 | |
| Effective Green, g (s) | | | 41.6 | 53.6 | 38.0 | |
| Actuated g/C Ratio | | | 0.78 | 1.00 | 0.71 | |
| Clearance Time (s) | | | 6.0 | | 6.0 | |
| Vehicle Extension (s) | | | 3.0 | | 3.0 | |
| Lane Grp Cap (vph) | | | 624 | 3008 | 2105 | |
| v/s Ratio Prot | | | 0.01 | 0.12 | c0.17 | |
| v/s Ratio Perm | | | 0.07 | | | |
| v/c Ratio | | | 0.10 | 0.12 | 0.24 | |
| Uniform Delay, d1 | | | 1.4 | 0.0 | 2.7 | |
| Progression Factor | | | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | | | 0.1 | 0.1 | 0.3 | |
| Delay (s) | | | 1.5 | 0.1 | 3.0 | |
| Level of Service | | | A | A | A | |
| Approach Delay (s) | 0.0 | | | 0.3 | 3.0 | |
| Approach LOS | A | | | A | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 1.8 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.24 | | |
| Actuated Cycle Length (s) | 53.6 | Sum of lost time (s) | 12.0 |
| Intersection Capacity Utilization | 53.8% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

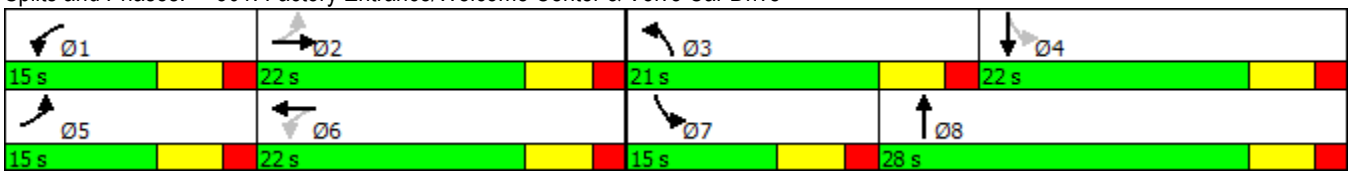
c Critical Lane Group

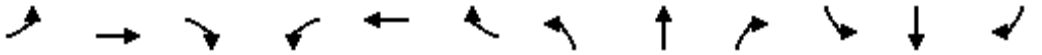
HCM 2010 analysis expects strict NEMA phasing.

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 10 | 32 | 69 | 31 | 155 | 622 | 10 | 10 | 10 |
| Future Volume (vph) | 10 | 32 | 69 | 31 | 155 | 622 | 10 | 10 | 10 |
| Turn Type | pm+pt | NA | Free | pm+pt | NA | Prot | NA | pm+pt | NA |
| Protected Phases | 5 | 2 | | 1 | 6 | 3 | 8 | 7 | 4 |
| Permitted Phases | 2 | | Free | 6 | | | | 4 | |
| Detector Phase | 5 | 2 | | 1 | 6 | 3 | 8 | 7 | 4 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| Minimum Split (s) | 15.0 | 22.0 | | 15.0 | 22.0 | 15.0 | 22.0 | 15.0 | 22.0 |
| Total Split (s) | 15.0 | 22.0 | | 15.0 | 22.0 | 21.0 | 28.0 | 15.0 | 22.0 |
| Total Split (%) | 18.8% | 27.5% | | 18.8% | 27.5% | 26.3% | 35.0% | 18.8% | 27.5% |
| Yellow Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | | | | | | | | | |
| Recall Mode | None | Min | | None | Min | None | None | None | None |
| Act Effct Green (s) | 7.8 | 4.8 | 39.6 | 9.4 | 7.2 | 16.1 | 16.3 | 7.1 | 6.3 |
| Actuated g/C Ratio | 0.20 | 0.12 | 1.00 | 0.24 | 0.18 | 0.41 | 0.41 | 0.18 | 0.16 |
| v/c Ratio | 0.03 | 0.10 | 0.05 | 0.09 | 0.33 | 0.49 | 0.38 | 0.03 | 0.08 |
| Control Delay | 12.1 | 20.4 | 0.1 | 12.1 | 17.1 | 14.2 | 4.3 | 12.8 | 15.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 12.1 | 20.4 | 0.1 | 12.1 | 17.1 | 14.2 | 4.3 | 12.8 | 15.8 |
| LOS | B | C | A | B | B | B | A | B | B |
| Approach Delay | | 7.0 | | | 16.3 | | 11.1 | | 14.8 |
| Approach LOS | | A | | | B | | B | | B |

| Intersection Summary | |
|---|---|
| Cycle Length: 80 | |
| Actuated Cycle Length: 39.6 | |
| Natural Cycle: 80 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.49 | |
| Intersection Signal Delay: 11.6 | Intersection LOS: B |
| Intersection Capacity Utilization 42.8% | ICU Level of Service A |
| Analysis Period (min) 15 | |

Splits and Phases: 301: Factory Entrance/Welcome Center & Volvo Car Drive





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 10 | 32 | 69 | 31 | 155 | 10 | 622 | 10 | 278 | 10 | 10 | 10 |
| Future Volume (veh/h) | 10 | 32 | 69 | 31 | 155 | 10 | 622 | 10 | 278 | 10 | 10 | 10 |
| Number | 5 | 2 | 12 | 1 | 6 | 16 | 3 | 8 | 18 | 7 | 4 | 14 |
| 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 | 1863 | 1583 | 1863 | 1863 | 1598 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 11 | 36 | 0 | 34 | 172 | 11 | 691 | 11 | 309 | 11 | 11 | 11 |
| Adj No. of Lanes | 1 | 2 | 1 | 1 | 2 | 0 | 2 | 1 | 0 | 1 | 1 | 0 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | 2 | 20 | 2 | 2 | 20 | 20 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 279 | 376 | 198 | 362 | 418 | 27 | 878 | 18 | 503 | 260 | 71 | 71 |
| Arrive On Green | 0.01 | 0.13 | 0.00 | 0.03 | 0.14 | 0.14 | 0.26 | 0.33 | 0.33 | 0.01 | 0.08 | 0.08 |
| Sat Flow, veh/h | 1774 | 3008 | 1583 | 1774 | 2899 | 184 | 3442 | 55 | 1537 | 1774 | 856 | 856 |
| Grp Volume(v), veh/h | 11 | 36 | 0 | 34 | 89 | 94 | 691 | 0 | 320 | 11 | 0 | 22 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 1504 | 1583 | 1774 | 1518 | 1565 | 1721 | 0 | 1592 | 1774 | 0 | 1712 |
| Q Serve(g_s), s | 0.3 | 0.5 | 0.0 | 0.8 | 2.5 | 2.6 | 8.9 | 0.0 | 8.0 | 0.3 | 0.0 | 0.6 |
| Cycle Q Clear(g_c), s | 0.3 | 0.5 | 0.0 | 0.8 | 2.5 | 2.6 | 8.9 | 0.0 | 8.0 | 0.3 | 0.0 | 0.6 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.12 | 1.00 | | 0.97 | 1.00 | | 0.50 |
| Lane Grp Cap(c), veh/h | 279 | 376 | 198 | 362 | 219 | 226 | 878 | 0 | 521 | 260 | 0 | 143 |
| V/C Ratio(X) | 0.04 | 0.10 | 0.00 | 0.09 | 0.41 | 0.41 | 0.79 | 0.00 | 0.61 | 0.04 | 0.00 | 0.15 |
| Avail Cap(c_a), veh/h | 596 | 1014 | 534 | 645 | 512 | 528 | 1088 | 0 | 738 | 576 | 0 | 577 |
| 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 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 17.8 | 18.4 | 0.0 | 17.3 | 18.5 | 18.5 | 16.5 | 0.0 | 13.4 | 19.6 | 0.0 | 20.2 |
| Incr Delay (d2), s/veh | 0.1 | 0.1 | 0.0 | 0.1 | 1.2 | 1.2 | 3.1 | 0.0 | 1.2 | 0.1 | 0.0 | 0.5 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(95%),veh/ln | 0.2 | 0.4 | 0.0 | 0.7 | 2.1 | 2.1 | 8.1 | 0.0 | 6.5 | 0.2 | 0.0 | 0.5 |
| LnGrp Delay(d),s/veh | 17.9 | 18.5 | 0.0 | 17.4 | 19.7 | 19.7 | 19.6 | 0.0 | 14.6 | 19.6 | 0.0 | 20.7 |
| LnGrp LOS | B | B | | B | B | B | B | | B | B | | C |
| Approach Vol, veh/h | | 47 | | | 217 | | | 1011 | | | 33 | |
| Approach Delay, s/veh | | 18.4 | | | 19.3 | | | 18.0 | | | 20.3 | |
| Approach LOS | | B | | | B | | | 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 | 7.4 | 11.9 | 18.1 | 10.0 | 6.5 | 12.8 | 6.5 | 21.5 |
| 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 | 15.0 | 16.0 | 9.0 | 16.0 | 9.0 | 22.0 |
| Max Q Clear Time (g_c+I1), s | 2.8 | 2.5 | 10.9 | 2.6 | 2.3 | 4.6 | 2.3 | 10.0 |
| Green Ext Time (p_c), s | 0.0 | 2.5 | 1.2 | 1.1 | 0.0 | 2.3 | 0.0 | 1.0 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 18.3 |
| HCM 2010 LOS | B |

# Appendix F

# 2039 Freeway Analysis Worksheets

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 6/15/16 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Eastbound |
| From/To: | West of SC 27 |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2039 Design Year |
| Description: | 171001612 - No Build - 4k |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 3130 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 869 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 1913 | 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 | 1913 | pc/h/ln |
| Free-flow speed, FFS | 75.4 | mi/h |
| Average passenger-car speed, S | 65.8 | mi/h |
| Number of lanes, N | 2 | |
| Density, D | 29.1 | pc/mi/ln |
| Level of service, LOS | D | |

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 6/15/16 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Eastbound |
| From/To: | West of SC 27 |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2039 Design Year |
| Description: | 171001612 - No Build - 4k |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 3130 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 869 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 1275 | 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 | 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 | 0.0 | mi/h |
| Free-flow speed, FFS | 75.4 | mi/h |

## LOS and Performance Measures

| | | |
|---|---|---|
| Flow rate, vp | 1275 | pc/h/ln |
| Free-flow speed, FFS | 75.4 | mi/h |
| Average passenger-car speed, S | 74.2 | mi/h |
| Number of lanes, N | 3 | |
| Density, D | 17.2 | pc/mi/ln |
| Level of service, LOS | B | |

HCS 2010: Freeway Merge and Diverge Segments Release 6.60

Phone: Fax:
E-mail:

## Diverge Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency/Co.: | Stantec |
| Date performed: | 6/15/16 |
| Analysis time period: | 3:00 - 4:00 PM |
| Freeway/Dir of Travel: | I-26 Eastbound |
| Junction: | SC 27 Off-Ramp |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2039 Design Year |
| Description: | 171001612 - No Build - 4k |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Diverge | |
| Number of lanes in freeway | 3 | |
| Free-flow speed on freeway | 75.0 | mph |
| Volume on freeway | 3130 | 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 | 214 | 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 | 1674 | vph |
| Position of adjacent ramp | Downstream | |
| Type of adjacent ramp | On | |
| Distance to adjacent ramp | 2330 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | Ramp | Adjacent Ramp | |
|---|---|---|---|---|
| Volume, V (vph) | 3130 | 214 | 1674 | vph |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | |
| Peak 15-min volume, v15 | 869 | 59 | 465 | v |
| Trucks and buses | 20 | 20 | 20 | % |
| Recreational vehicles | 0 | 0 | 0 | % |
| Terrain type: | Level | Level | Level | |
| Grade | 0.00 % | 0.00 % | 0.00 % | |
| Length | 0.00 mi | 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 | 0.909 | 0.909 | 0.909 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 3826 | 262 | 2046 | pcph |

## Estimation of V12 Diverge Areas

$L_{EQ}$ = (Equation 13-12 or 13-13)

$P_{FD}$ = 0.652 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2587 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{Fi} = v_F$ | 3826 | 7200 | No |
| $v_{FO} = v_F - v_R$ | 3564 | 7200 | No |
| $v_R$ | 262 | 2000 | No |
| $v_3$ or $v_{av34}$ | 1239 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, $v_{12A}$ = 2587 (Equation 13-15, 13-16, 13-18, or 13-19)

## Flow Entering Diverge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{12}$ | 2587 | 4400 | No |

## Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 22.5 pc/mi/ln

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

## Speed Estimation

| | | |
|---|---|---|
| Intermediate speed variable, | $D_S$ = 0.452 | |
| Space mean speed in ramp influence area, | $S_R$ = 60.1 | mph |
| Space mean speed in outer lanes, | $S_O$ = 81.3 | mph |
| Space mean speed for all vehicles, | $S$ = 65.7 | mph |

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 6/15/16 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Eastbound |
| From/To: | SC 27 Interchange |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2039 Design Year |
| Description: | 171001612 - No Build - 4k |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 2916 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 810 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 1188 | 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 | 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 | 0.0 | mi/h |
| Free-flow speed, FFS | 75.4 | mi/h |

## LOS and Performance Measures

| | | |
|---|---|---|
| Flow rate, vp | 1188 | pc/h/ln |
| Free-flow speed, FFS | 75.4 | mi/h |
| Average passenger-car speed, S | 74.6 | mi/h |
| Number of lanes, N | 3 | |
| Density, D | 15.9 | pc/mi/ln |
| Level of service, LOS | B | |

Phone: Fax:
E-mail:

## Merge Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency/Co.: | Stantec |
| Date performed: | 6/15/16 |
| Analysis time period: | 3:00 - 4:00 PM |
| Freeway/Dir of Travel: | I-26 Eastbound |
| Junction: | SC 27 On-Ramp |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2039 Design Year |
| Description: | 171001612 - No Build - 4k |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Merge | |
| Number of lanes in freeway | 3 | |
| Free-flow speed on freeway | 75.0 | mph |
| Volume on freeway | 2916 | 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 | 1674 | 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 | 214 | vph |
| Position of adjacent Ramp | Upstream | |
| Type of adjacent Ramp | Off | |
| Distance to adjacent Ramp | 2330 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | Ramp | Adjacent Ramp | |
|---|---|---|---|---|
| Volume, V (vph) | 2916 | 1674 | 214 | vph |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | |
| Peak 15-min volume, v15 | 810 | 465 | 59 | v |
| Trucks and buses | 20 | 20 | 20 | % |
| 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 | 0.909 | 0.909 | 0.909 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 3564 | 2046 | 262 | pcph |

## Estimation of V12 Merge Areas

$L_{EQ}$ = 983.94 (Equation 13-6 or 13-7)

$P_{FM}$ = 0.600 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 2138 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{FO}$ | 5610 | 7200 | No |
| $v_3$ or $v_{av34}$ | 1426 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, $v_{12A}$ = 2138 (Equation 13-15, 13-16, 13-18, or 13-19)

## Flow Entering Merge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{12A}$ | 4184 | 4600 | No |

## Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 32.2 pc/mi/ln

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

## Speed Estimation

| | | |
|---|---|---|
| Intermediate speed variable, | $M_S$ = 0.521 | |
| Space mean speed in ramp influence area, | $S_R$ = 57.8 | mph |
| Space mean speed in outer lanes, | $S_O$ = 71.7 | mph |
| Space mean speed for all vehicles, | $S$ = 60.8 | mph |

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 6/15/16 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Eastbound |
| From/To: | SC 27 to Jedburg |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2039 Design Year |
| Description: | 171001612 - No Build - 4k |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 4590 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 1275 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 1870 | 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 | 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 | 0.0 | mi/h |
| Free-flow speed, FFS | 75.4 | mi/h |

## LOS and Performance Measures

| | | |
|---|---|---|
| Flow rate, vp | 1870 | pc/h/ln |
| Free-flow speed, FFS | 75.4 | mi/h |
| Average passenger-car speed, S | 66.6 | mi/h |
| Number of lanes, N | 3 | |
| Density, D | 28.1 | pc/mi/ln |
| Level of service, LOS | D | |

HCS 2010: Freeway Merge and Diverge Segments Release 6.60

Phone: Fax:
E-mail:

## Diverge Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency/Co.: | Stantec |
| Date performed: | 6/15/16 |
| Analysis time period: | 3:00 - 4:00 PM |
| Freeway/Dir of Travel: | I-26 Eastbound |
| Junction: | Jedburg Off-Ramp |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2039 Design Year |
| Description: | 171001612 - No Build - 4k |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Diverge | |
| Number of lanes in freeway | 3 | |
| Free-flow speed on freeway | 75.0 | mph |
| Volume on freeway | 4590 | 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 | 313 | 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 | 675 | vph |
| Position of adjacent ramp | Downstream | |
| Type of adjacent ramp | On | |
| Distance to adjacent ramp | 1620 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | Ramp | Adjacent Ramp | |
|---|---|---|---|---|
| Volume, V (vph) | 4590 | 313 | 675 | vph |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | |
| Peak 15-min volume, v15 | 1275 | 87 | 188 | v |
| Trucks and buses | 20 | 20 | 20 | % |
| Recreational vehicles | 0 | 0 | 0 | % |
| Terrain type: | Level | Level | Level | |
| Grade | 0.00 % | 0.00 % | 0.00 % | |
| Length | 0.00 mi | 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 | 0.909 | 0.909 | 0.909 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 5610 | 383 | 825 | pcph |

## Estimation of V12 Diverge Areas

$L_{EQ}$ = (Equation 13-12 or 13-13)

$P_{FD}$ = 0.602 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3530 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{Fi} = v_F$ | 5610 | 7200 | No |
| $v_{FO} = v_F - v_R$ | 5227 | 7200 | No |
| $v_R$ | 383 | 2000 | No |
| $v_3$ or $v_{av34}$ | 2080 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, $v_{12A}$ = 3530 (Equation 13-15, 13-16, 13-18, or 13-19)

## Flow Entering Diverge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{12}$ | 3530 | 4400 | No |

## Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 30.1 pc/mi/ln

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

## Speed Estimation

Intermediate speed variable, $D_S$ = 0.462

Space mean speed in ramp influence area, $S_R$ = 59.7 mph

Space mean speed in outer lanes, $S_0$ = 78.1 mph

Space mean speed for all vehicles, $S$ = 65.4 mph

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 6/15/16 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Eastbound |
| From/To: | Jedburg Interchange |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2039 Design Year |
| Description: | 171001612 - No Build - 4k |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 4277 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 1188 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 1742 | 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 | 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 | 0.0 | mi/h |
| Free-flow speed, FFS | 75.4 | mi/h |

## LOS and Performance Measures

| | | |
|---|---|---|
| Flow rate, vp | 1742 | pc/h/ln |
| Free-flow speed, FFS | 75.4 | mi/h |
| Average passenger-car speed, S | 68.9 | mi/h |
| Number of lanes, N | 3 | |
| Density, D | 25.3 | pc/mi/ln |
| Level of service, LOS | C | |

Phone: Fax:
E-mail:

## Merge Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency/Co.: | Stantec |
| Date performed: | 6/15/16 |
| Analysis time period: | 3:00 - 4:00 PM |
| Freeway/Dir of Travel: | I-26 Eastbound |
| Junction: | Jedburg On-Ramp |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2039 Design Year |
| Description: | 171001612 - No Build - 4k |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Merge | |
| Number of lanes in freeway | 3 | |
| Free-flow speed on freeway | 75.0 | mph |
| Volume on freeway | 4277 | 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 | 675 | vph |
| Length of first accel/decel lane | 1150 | ft |
| Length of second accel/decel lane | | ft |

## Adjacent Ramp Data (if one exists)

| | | |
|---|---|---|
| Does adjacent ramp exist? | Yes | |
| Volume on adjacent Ramp | 313 | vph |
| Position of adjacent Ramp | Upstream | |
| Type of adjacent Ramp | Off | |
| Distance to adjacent Ramp | 1620 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | Ramp | Adjacent Ramp | |
|---|---|---|---|---|
| Volume, V (vph) | 4277 | 675 | 313 | vph |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | |
| Peak 15-min volume, v15 | 1188 | 188 | 87 | v |
| Trucks and buses | 20 | 20 | 20 | % |
| 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 | 0.909 | 0.909 | 0.909 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 5227 | 825 | 383 | pcph |

## Estimation of V12 Merge Areas

$L_{EQ}$ = 1233.93 (Equation 13-6 or 13-7)

$P_{FM}$ = 0.610 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 3187 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{FO}$ | 6052 | 7200 | No |
| $v_3$ or $v_{av34}$ | 2040 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, $v_{12A}$ = 3187 (Equation 13-15, 13-16, 13-18, or 13-19)

## Flow Entering Merge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{12A}$ | 4012 | 4600 | No |

## Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 29.2 pc/mi/ln

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

## Speed Estimation

Intermediate speed variable, $M_S$ = 0.456

Space mean speed in ramp influence area, $S_R$ = 60.0 mph

Space mean speed in outer lanes, $S_O$ = 69.5 mph

Space mean speed for all vehicles, $S$ = 62.9 mph

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 6/15/16 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Eastbound |
| From/To: | East of Jedburg |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2039 Design Year |
| Description: | 171001612 - No Build - 4k |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 4952 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 1376 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 2017 | pc/h/ln |

## Speed Inputs and Adjustments

| | | |
|---|---|---|
| Lane width | 12.0 | ft |
| Right-side lateral clearance | 6.0 | ft |
| Total ramp density, TRD | 1.17 | 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 | 3.7 | mi/h |
| Free-flow speed, FFS | 71.7 | mi/h |

## LOS and Performance Measures

| | | |
|---|---|---|
| Flow rate, vp | 2017 | pc/h/ln |
| Free-flow speed, FFS | 71.7 | mi/h |
| Average passenger-car speed, S | 62.3 | mi/h |
| Number of lanes, N | 3 | |
| Density, D | 32.4 | pc/mi/ln |
| Level of service, LOS | D | |

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 6/15/16 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Westbound |
| From/To: | East of Jedburg |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2039 Design Year |
| Description: | 171001612 - No Build - 4k |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 4397 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 1221 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 1791 | 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 | 1791 | pc/h/ln |
| Free-flow speed, FFS | 71.3 | mi/h |
| Average passenger-car speed, S | 65.9 | mi/h |
| Number of lanes, N | 3 | |
| Density, D | 27.2 | pc/mi/ln |
| Level of service, LOS | D | |

Phone: Fax:
E-mail:

## Diverge Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency/Co.: | Stantec |
| Date performed: | 6/15/16 |
| Analysis time period: | 3:00 - 4:00 PM |
| Freeway/Dir of Travel: | I-26 Westbound |
| Junction: | Jedburg Off-Ramp |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2039 Design Year |
| Description: | 171001612 - No Build - 4k |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Diverge | |
| Number of lanes in freeway | 3 | |
| Free-flow speed on freeway | 71.3 | mph |
| Volume on freeway | 4397 | 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 | 421 | vph |
| Length of first accel/decel lane | 750 | ft |
| Length of second accel/decel lane | | ft |

## Adjacent Ramp Data (if one exists)

| | | |
|---|---|---|
| Does adjacent ramp exist? | Yes | |
| Volume on adjacent ramp | 626 | vph |
| Position of adjacent ramp | Downstream | |
| 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) | 4397 | 421 | 626 | vph |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | |
| Peak 15-min volume, v15 | 1221 | 117 | 174 | v |
| Trucks and buses | 20 | 20 | 20 | % |
| Recreational vehicles | 0 | 0 | 0 | % |
| Terrain type: | Level | Level | Level | |
| Grade | 0.00 % | 0.00 % | 0.00 % | |
| Length | 0.00 mi | 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 | 0.909 | 0.909 | 0.909 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 5374 | 515 | 765 | pcph |

## Estimation of V12 Diverge Areas

$L_{EQ}$ = 971.54 (Equation 13-12 or 13-13)

$P_{FD}$ = 0.630 Using Equation 7

$v_{12} = v_R + (v - v_F) P_{FD}$ = 3574 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{Fi} = v$ | 5374 | 7200 | No |
| $v_{FO} = v - v_R$ | 4859 | 7200 | No |
| $v_R$ | 515 | 2000 | No |
| $v_3$ or $v_{av34}$ | 1800 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, $v_{12A}$ = 3574 (Equation 13-15, 13-16, 13-18, or 13-19)

## Flow Entering Diverge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{12}$ | 3574 | 4400 | No |

## Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\ v_R - 0.009\ L_D$ = 28.2 pc/mi/ln

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

## Speed Estimation

| | | |
|---|---|---|
| Intermediate speed variable, | $D_S$ = 0.474 | |
| Space mean speed in ramp influence area, | $S_R$ = 57.4 | mph |
| Space mean speed in outer lanes, | $S_O$ = 75.1 | mph |
| Space mean speed for all vehicles, | $S$ = 62.3 | mph |

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 6/15/16 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Westbound |
| From/To: | Jedburg Off-Ramp to Loop Ramp |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2039 Design Year |
| Description: | 171001612 - Build - 4k |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 3976 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 1104 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 1620 | 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 | 1620 | pc/h/ln |
| Free-flow speed, FFS | 71.3 | mi/h |
| Average passenger-car speed, S | 68.0 | mi/h |
| Number of lanes, N | 3 | |
| Density, D | 23.8 | pc/mi/ln |
| Level of service, LOS | C | |

Phone: Fax:
E-mail:

## Diverge Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency/Co.: | Stantec |
| Date performed: | 6/15/16 |
| Analysis time period: | 3:00 - 4:00 PM |
| Freeway/Dir of Travel: | I-26 Westbound |
| Junction: | Jedburg Loop Off-Ramp |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2039 Design Year |
| Description: | 171001612 - No Build - 4k |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Diverge | |
| Number of lanes in freeway | 3 | |
| Free-flow speed on freeway | 71.3 | mph |
| Volume on freeway | 3976 | 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 | 626 | vph |
| Length of first accel/decel lane | 750 | ft |
| Length of second accel/decel lane | | ft |

## Adjacent Ramp Data (if one exists)

| | | |
|---|---|---|
| Does adjacent ramp exist? | Yes | |
| Volume on adjacent ramp | 421 | 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) | 3976 | 626 | 421 | vph |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | |
| Peak 15-min volume, v15 | 1104 | 174 | 117 | v |
| Trucks and buses | 20 | 20 | 20 | % |
| Recreational vehicles | 0 | 0 | 0 | % |
| Terrain type: | Level | Level | Level | |
| Grade | 0.00 % | 0.00 % | 0.00 % | |
| Length | 0.00 mi | 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 | 0.909 | 0.909 | 0.909 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 4860 | 765 | 515 | pcph |

## Estimation of V12 Diverge Areas

$L_{EQ}$ = (Equation 13-12 or 13-13)

$P_{FD}$ = 0.603 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3236 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{Fi} = v_F$ | 4860 | 7200 | No |
| $v_{FO} = v_F - v_R$ | 4095 | 7200 | No |
| $v_R$ | 765 | 2000 | No |
| $v_3$ or $v_{av34}$ | 1624 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, $v_{12A}$ = 3236 (Equation 13-15, 13-16, 13-18, or 13-19)

## Flow Entering Diverge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{12}$ | 3236 | 4400 | No |

## Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, L_{12}$ = 25.3 pc/mi/ln

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

## Speed Estimation

| | | |
|---|---|---|
| Intermediate speed variable, | $D_S$ = 0.497 | |
| Space mean speed in ramp influence area, | $S_R$ = 56.7 | mph |
| Space mean speed in outer lanes, | $S_0$ = 75.8 | mph |
| Space mean speed for all vehicles, | $S$ = 61.9 | mph |

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 6/15/16 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Westbound |
| From/To: | Jedburg Loop Ramp to On-Ramp |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2039 Design Year |
| Description: | 171001612 - No Build - 4k |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 3350 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 931 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 1365 | 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 | 1365 | pc/h/ln |
| Free-flow speed, FFS | 71.3 | mi/h |
| Average passenger-car speed, S | 69.7 | mi/h |
| Number of lanes, N | 3 | |
| Density, D | 19.6 | pc/mi/ln |
| Level of service, LOS | C | |

Phone: Fax:
E-mail:

## Merge Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency/Co.: | Stantec |
| Date performed: | 6/15/16 |
| Analysis time period: | 3:00 - 4:00 PM |
| Freeway/Dir of Travel: | I-26 Westbound |
| Junction: | Jedburg On-Ramp |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2039 Design Year |
| Description: | 171001612 - No Build - 4k |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Merge | |
| Number of lanes in freeway | 3 | |
| Free-flow speed on freeway | 71.3 | mph |
| Volume on freeway | 3350 | 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 | 427 | vph |
| Length of first accel/decel lane | 1300 | ft |
| Length of second accel/decel lane | | ft |

## Adjacent Ramp Data (if one exists)

| | | |
|---|---|---|
| Does adjacent ramp exist? | Yes | |
| Volume on adjacent Ramp | 626 | vph |
| Position of adjacent Ramp | Upstream | |
| Type of adjacent Ramp | Off | |
| Distance to adjacent Ramp | 900 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | Ramp | Adjacent Ramp | |
|---|---|---|---|---|
| Volume, V (vph) | 3350 | 427 | 626 | vph |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | |
| Peak 15-min volume, v15 | 931 | 119 | 174 | v |
| Trucks and buses | 20 | 20 | 20 | % |
| 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 | 0.909 | 0.909 | 0.909 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 4094 | 522 | 765 | pcph |

## Estimation of V12 Merge Areas

$L_{EQ}$ = 993.22 (Equation 13-6 or 13-7)

$P_{FM}$ = 0.608 Using Equation 2

$v_{12} = v_F (P_{FM})$ = 2489 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{FO}$ | 4616 | 7200 | No |
| $v_3$ or $v_{av34}$ | 1605 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, $v_{12A}$ = 2489 (Equation 13-15, 13-16, 13-18, or 13-19)

## Flow Entering Merge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{12A}$ | 3011 | 4600 | No |

## Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 20.6 pc/mi/ln

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

## Speed Estimation

| | | |
|---|---|---|
| Intermediate speed variable, | $M_S$ = 0.309 | |
| Space mean speed in ramp influence area, | $S_R$ = 62.2 | mph |
| Space mean speed in outer lanes, | $S_O$ = 67.3 | mph |
| Space mean speed for all vehicles, | $S$ = 63.9 | mph |

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 6/15/16 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Westbound |
| From/To: | Jedburg to SC 27 |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2039 Design Year |
| Description: | 171001612 - No Build - 4k |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 3777 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 1049 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 1539 | 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 | 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 | 0.0 | mi/h |
| Free-flow speed, FFS | 75.4 | mi/h |

## LOS and Performance Measures

| | | |
|---|---|---|
| Flow rate, vp | 1539 | pc/h/ln |
| Free-flow speed, FFS | 75.4 | mi/h |
| Average passenger-car speed, S | 71.8 | mi/h |
| Number of lanes, N | 3 | |
| Density, D | 21.4 | pc/mi/ln |
| Level of service, LOS | C | |

Phone: Fax:
E-mail:

## Diverge Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency/Co.: | Stantec |
| Date performed: | 6/15/16 |
| Analysis time period: | 3:00 - 4:00 PM |
| Freeway/Dir of Travel: | I-26 Westbound |
| Junction: | SC 27 Off-Ramp |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2039 Design Year |
| Description: | 171001612 - No Build - 4k |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Diverge | |
| Number of lanes in freeway | 3 | |
| Free-flow speed on freeway | 75.0 | mph |
| Volume on freeway | 3777 | 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 | 871 | 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 | 427 | vph |
| Position of adjacent ramp | Downstream | |
| Type of adjacent ramp | On | |
| Distance to adjacent ramp | 2175 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | Ramp | Adjacent Ramp | |
|---|---|---|---|---|
| Volume, V (vph) | 3777 | 871 | 427 | vph |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | |
| Peak 15-min volume, v15 | 1049 | 242 | 119 | v |
| Trucks and buses | 20 | 20 | 20 | % |
| Recreational vehicles | 0 | 0 | 0 | % |
| Terrain type: | Level | Level | Level | |
| Grade | 0.00 % | 0.00 % | 0.00 % | |
| Length | 0.00 mi | 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 | 0.909 | 0.909 | 0.909 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 4616 | 1065 | 522 | pcph |

## Estimation of V12 Diverge Areas

$L_{EQ}$ = (Equation 13-12 or 13-13)

$P_{FD}$ = 0.596 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3180 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{Fi} = v_F$ | 4616 | 7200 | No |
| $v_{FO} = v_F - v_R$ | 3551 | 7200 | No |
| $v_R$ | 1065 | 2000 | No |
| $v_3$ or $v_{av34}$ | 1436 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, $v_{12A}$ = 3180 (Equation 13-15, 13-16, 13-18, or 13-19)

## Flow Entering Diverge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{12}$ | 3180 | 4400 | No |

## Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 27.1 pc/mi/ln

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

## Speed Estimation

Intermediate speed variable, $D_S$ = 0.524

Space mean speed in ramp influence area, $S_R$ = 57.7 mph

Space mean speed in outer lanes, $S_O$ = 80.6 mph

Space mean speed for all vehicles, $S$ = 63.3 mph

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 6/15/16 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Westbound |
| From/To: | SC 27 Interchange |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2039 Design Year |
| Description: | 171001612 - No Build - 4k |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 2906 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 807 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| 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 | 0.00 | 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 | 0.0 | mi/h |
| Free-flow speed, FFS | 75.4 | mi/h |

## LOS and Performance Measures

| | | |
|---|---|---|
| Flow rate, vp | 1184 | pc/h/ln |
| Free-flow speed, FFS | 75.4 | mi/h |
| Average passenger-car speed, S | 74.6 | mi/h |
| Number of lanes, N | 3 | |
| Density, D | 15.9 | pc/mi/ln |
| Level of service, LOS | B | |

Phone: Fax:
E-mail:

## Merge Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency/Co.: | Stantec |
| Date performed: | 6/15/16 |
| Analysis time period: | 3:00 - 4:00 PM |
| Freeway/Dir of Travel: | I-26 Westbound |
| Junction: | SC 27 On-Ramp |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2039 Design Year |
| Description: | 171001612 - No Build - 4k |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Merge | |
| Number of lanes in freeway | 3 | |
| Free-flow speed on freeway | 75.0 | mph |
| Volume on freeway | 2906 | 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 | 427 | vph |
| Length of first accel/decel lane | 925 | ft |
| Length of second accel/decel lane | | ft |

## Adjacent Ramp Data (if one exists)

| | | |
|---|---|---|
| Does adjacent ramp exist? | Yes | |
| Volume on adjacent Ramp | 871 | vph |
| Position of adjacent Ramp | Upstream | |
| Type of adjacent Ramp | Off | |
| Distance to adjacent Ramp | 2175 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | Ramp | Adjacent Ramp | |
|---|---|---|---|---|
| Volume, V (vph) | 2906 | 427 | 871 | vph |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | |
| Peak 15-min volume, v15 | 807 | 119 | 242 | v |
| Trucks and buses | 20 | 20 | 20 | % |
| 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 | 0.909 | 0.909 | 0.909 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 3552 | 522 | 1065 | pcph |

## Estimation of V12 Merge Areas

$L_{EQ}$ = 710.74 (Equation 13-6 or 13-7)

$P_{FM}$ = 0.603 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 2143 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{FO}$ | 4074 | 7200 | No |
| $v_3$ or $v_{av34}$ | 1409 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, $v_{12A}$ = 2143 (Equation 13-15, 13-16, 13-18, or 13-19)

## Flow Entering Merge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{12A}$ | 2665 | 4600 | No |

## Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 20.2 pc/mi/ln

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

## Speed Estimation

| | | |
|---|---|---|
| Intermediate speed variable, | $M_S$ = 0.312 | |
| Space mean speed in ramp influence area, | $S_R$ = 64.7 | mph |
| Space mean speed in outer lanes, | $S_O$ = 71.7 | mph |
| Space mean speed for all vehicles, | $S$ = 67.0 | mph |

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 6/15/16 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Westbound |
| From/To: | West of SC 27 |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2039 Design Year |
| Description: | 171001612 - No Build - 4k |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 3333 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 926 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 1358 | 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 | 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 | 0.0 | mi/h |
| Free-flow speed, FFS | 75.4 | mi/h |

## LOS and Performance Measures

| | | |
|---|---|---|
| Flow rate, vp | 1358 | pc/h/ln |
| Free-flow speed, FFS | 75.4 | mi/h |
| Average passenger-car speed, S | 73.6 | mi/h |
| Number of lanes, N | 3 | |
| Density, D | 18.5 | pc/mi/ln |
| Level of service, LOS | C | |

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 6/15/16 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Westbound |
| From/To: | West of SC 27 |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2039 Design Year |
| Description: | 171001612 - No Build - 4k |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 3333 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 926 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 2037 | 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 | 2037 | pc/h/ln |
| Free-flow speed, FFS | 75.4 | mi/h |
| Average passenger-car speed, S | 63.1 | mi/h |
| Number of lanes, N | 2 | |
| Density, D | 32.3 | pc/mi/ln |
| Level of service, LOS | D | |

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 6/15/16 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Eastbound |
| From/To: | West of SC 27 |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2039 Design Year |
| Description: | 171001612 - Build - 4k |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 3130 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 869 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 1913 | 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 | 1913 | pc/h/ln |
| Free-flow speed, FFS | 75.4 | mi/h |
| Average passenger-car speed, S | 65.8 | mi/h |
| Number of lanes, N | 2 | |
| Density, D | 29.1 | pc/mi/ln |
| Level of service, LOS | D | |

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 6/15/16 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Eastbound |
| From/To: | West of SC 27 |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2039 Design Year |
| Description: | 171001612 - Build - 4k |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 3130 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 869 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 1275 | 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 | 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 | 0.0 | mi/h |
| Free-flow speed, FFS | 75.4 | mi/h |

## LOS and Performance Measures

| | | |
|---|---|---|
| Flow rate, vp | 1275 | pc/h/ln |
| Free-flow speed, FFS | 75.4 | mi/h |
| Average passenger-car speed, S | 74.2 | mi/h |
| Number of lanes, N | 3 | |
| Density, D | 17.2 | pc/mi/ln |
| Level of service, LOS | B | |

Phone: Fax:
E-mail:

## Diverge Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency/Co.: | Stantec |
| Date performed: | 6/15/16 |
| Analysis time period: | 3:00 - 4:00 PM |
| Freeway/Dir of Travel: | I-26 Eastbound |
| Junction: | SC 27 Off-Ramp |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2039 Design Year |
| Description: | 171001612 - Build - 4k |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Diverge | |
| Number of lanes in freeway | 3 | |
| Free-flow speed on freeway | 75.0 | mph |
| Volume on freeway | 3130 | 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 | 164 | 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 | 378 | vph |
| Position of adjacent ramp | Downstream | |
| Type of adjacent ramp | On | |
| Distance to adjacent ramp | 2330 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | Ramp | Adjacent Ramp | |
|---|---|---|---|---|
| Volume, V (vph) | 3130 | 164 | 378 | vph |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | |
| Peak 15-min volume, v15 | 869 | 46 | 105 | v |
| Trucks and buses | 20 | 20 | 20 | % |
| Recreational vehicles | 0 | 0 | 0 | % |
| Terrain type: | Level | Level | Level | |
| Grade | 0.00 % | 0.00 % | 0.00 % | |
| Length | 0.00 mi | 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 | 0.909 | 0.909 | 0.909 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 3826 | 200 | 462 | pcph |

## Estimation of V12 Diverge Areas

$L_{EQ}$ = (Equation 13-12 or 13-13)

$P_{FD}$ = 0.655 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2576 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{Fi} = v_F$ | 3826 | 7200 | No |
| $v_{FO} = v_F - v_R$ | 3626 | 7200 | No |
| $v_R$ | 200 | 2000 | No |
| $v_3$ or $v_{av34}$ | 1250 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, $v_{12A}$ = 2576 (Equation 13-15, 13-16, 13-18, or 13-19)

## Flow Entering Diverge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{12}$ | 2576 | 4400 | No |

## Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 22.4 pc/mi/ln

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

## Speed Estimation

Intermediate speed variable, $D_S$ = 0.446

Space mean speed in ramp influence area, $S_R$ = 60.3 mph

Space mean speed in outer lanes, $S_O$ = 81.3 mph

Space mean speed for all vehicles, $S$ = 65.8 mph

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 6/15/16 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Eastbound |
| From/To: | SC 27 Interchange |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2039 Design Year |
| Description: | 171001612 - Build - 4k |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 2966 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 824 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 1208 | 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 | 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 | 0.0 | mi/h |
| Free-flow speed, FFS | 75.4 | mi/h |

## LOS and Performance Measures

| | | |
|---|---|---|
| Flow rate, vp | 1208 | pc/h/ln |
| Free-flow speed, FFS | 75.4 | mi/h |
| Average passenger-car speed, S | 74.5 | mi/h |
| Number of lanes, N | 3 | |
| Density, D | 16.2 | pc/mi/ln |
| Level of service, LOS | B | |

Phone: Fax:
E-mail:

## Merge Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency/Co.: | Stantec |
| Date performed: | 6/15/16 |
| Analysis time period: | 3:00 - 4:00 PM |
| Freeway/Dir of Travel: | I-26 Eastbound |
| Junction: | SC 27 On-Ramp |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2039 Design Year |
| Description: | 171001612 - Build - 4k |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Merge | |
| Number of lanes in freeway | 3 | |
| Free-flow speed on freeway | 75.0 | mph |
| Volume on freeway | 2966 | 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 | 378 | 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 | 164 | vph |
| Position of adjacent Ramp | Upstream | |
| Type of adjacent Ramp | Off | |
| Distance to adjacent Ramp | 2330 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | Ramp | Adjacent Ramp | |
|---|---|---|---|---|
| Volume, V (vph) | 2966 | 378 | 164 | vph |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | |
| Peak 15-min volume, v15 | 824 | 105 | 46 | v |
| Trucks and buses | 20 | 20 | 20 | % |
| 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 | 0.909 | 0.909 | 0.909 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 3625 | 462 | 200 | pcph |

## Estimation of V12 Merge Areas

$L_{EQ}$ = 658.02 (Equation 13-6 or 13-7)

$P_{FM}$ = 0.600 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 2175 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{FO}$ | 4087 | 7200 | No |
| $v_3$ or $v_{av34}$ | 1450 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, $v_{12A}$ = 2175 (Equation 13-15, 13-16, 13-18, or 13-19)

## Flow Entering Merge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{12A}$ | 2637 | 4600 | No |

## Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 20.8 pc/mi/ln

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

## Speed Estimation

| | | |
|---|---|---|
| Intermediate speed variable, | $M_S$ = 0.319 | |
| Space mean speed in ramp influence area, | $S_R$ = 64.5 | mph |
| Space mean speed in outer lanes, | $S_O$ = 71.6 | mph |
| Space mean speed for all vehicles, | $S$ = 66.8 | mph |

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 6/15/16 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Eastbound |
| From/To: | SC 27 to New Interchange |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2039 Design Year |
| Description: | 171001612 - Build - 4k |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 3344 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 929 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 1362 | 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 | 1362 | pc/h/ln |
| Free-flow speed, FFS | 73.1 | mi/h |
| Average passenger-car speed, S | 73.5 | mi/h |
| Number of lanes, N | 3 | |
| Density, D | 18.5 | pc/mi/ln |
| Level of service, LOS | C | |

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 6/15/16 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Eastbound |
| From/To: | New Interchange Off-Ramp Area |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2039 Design Year |
| Description: | 171001612 - Build - 4k |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 3344 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 929 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 1022 | 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 | 4 | |
| Free-flow speed: | Base | |
| FFS 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 | 1022 | pc/h/ln |
| Free-flow speed, FFS | 73.1 | mi/h |
| Average passenger-car speed, S | 75.0 | mi/h |
| Number of lanes, N | 4 | |
| Density, D | 13.6 | pc/mi/ln |
| Level of service, LOS | B | |

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 6/15/16 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Eastbound |
| From/To: | New Interchange |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2039 Design Year |
| Description: | 171001612 - Build - 4k |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 3294 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 915 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 1342 | 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 | 1342 | 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 | |

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 6/15/16 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Eastbound |
| From/To: | New Interchange 2 On Ramp |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2039 Design Year |
| Description: | 171001612 - Build - 4k |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 4590 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 1275 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| 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 | 5 | |
| Free-flow speed: | Base | |
| FFS 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 | 5 | |
| Density, D | 15.0 | pc/mi/ln |
| Level of service, LOS | B | |

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 6/15/16 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Eastbound |
| From/To: | New Interchange 1 On Ramp |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2039 Design Year |
| Description: | 171001612 - Build - 4k |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 4590 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 1275 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 1402 | 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 | 4 | |
| Free-flow speed: | Base | |
| FFS 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 | 1402 | pc/h/ln |
| Free-flow speed, FFS | 73.1 | mi/h |
| Average passenger-car speed, S | 73.2 | mi/h |
| Number of lanes, N | 4 | |
| Density, D | 19.2 | pc/mi/ln |
| Level of service, LOS | C | |

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 6/15/16 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Eastbound |
| From/To: | New Interchange to Jedburg |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2039 Design Year |
| Description: | 171001612 - Build - 4k |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 4590 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 1275 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 1870 | 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 | 1870 | pc/h/ln |
| Free-flow speed, FFS | 73.1 | mi/h |
| Average passenger-car speed, S | 66.6 | mi/h |
| Number of lanes, N | 3 | |
| Density, D | 28.1 | pc/mi/ln |
| Level of service, LOS | D | |

HCS 2010: Freeway Merge and Diverge Segments Release 6.60

Phone: Fax:
E-mail:

## Diverge Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency/Co.: | Stantec |
| Date performed: | 6/15/16 |
| Analysis time period: | 3:00 - 4:00 PM |
| Freeway/Dir of Travel: | I-26 Eastbound |
| Junction: | Jedburg Off-Ramp |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2039 Design Year |
| Description: | 171001612 - Build - 4k |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Diverge | |
| Number of lanes in freeway | 3 | |
| Free-flow speed on freeway | 73.1 | mph |
| Volume on freeway | 4590 | 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 | 313 | 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 | 675 | vph |
| Position of adjacent ramp | Downstream | |
| Type of adjacent ramp | On | |
| Distance to adjacent ramp | 1620 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | | Ramp | | Adjacent Ramp | | |
|---|---|---|---|---|---|---|---|
| Volume, V (vph) | 4590 | | 313 | | 675 | | vph |
| Peak-hour factor, PHF | 0.90 | | 0.90 | | 0.90 | | |
| Peak 15-min volume, v15 | 1275 | | 87 | | 188 | | v |
| Trucks and buses | 20 | | 20 | | 20 | | % |
| Recreational vehicles | 0 | | 0 | | 0 | | % |
| Terrain type: | Level | | Level | | Level | | |
| Grade | 0.00 | % | 0.00 | % | 0.00 | % | |
| Length | 0.00 | mi | 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 | 0.909 | 0.909 | 0.909 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 5610 | 383 | 825 | pcph |

## Estimation of V12 Diverge Areas

$L_{EQ}$ = (Equation 13-12 or 13-13)

$P_{FD}$ = 0.602 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3530 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{Fi} = v_F$ | 5610 | 7200 | No |
| $v_{FO} = v_F - v_R$ | 5227 | 7200 | No |
| $v_R$ | 383 | 2000 | No |
| $v_3$ or $v_{av34}$ | 2080 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, $v_{12A}$ = 3530 (Equation 13-15, 13-16, 13-18, or 13-19)

## Flow Entering Diverge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{12}$ | 3530 | 4400 | No |

## Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 30.1 pc/mi/ln

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

## Speed Estimation

Intermediate speed variable, $D_S$ = 0.462

Space mean speed in ramp influence area, $S_R$ = 58.7 mph

Space mean speed in outer lanes, $S_0$ = 76.0 mph

Space mean speed for all vehicles, $S$ = 64.1 mph

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 6/15/16 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Eastbound |
| From/To: | Jedburg Interchange |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2039 Design Year |
| Description: | 171001612 - Build - 4k |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 4277 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 1188 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 1742 | 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 | 1742 | pc/h/ln |
| Free-flow speed, FFS | 73.1 | mi/h |
| Average passenger-car speed, S | 68.9 | mi/h |
| Number of lanes, N | 3 | |
| Density, D | 25.3 | pc/mi/ln |
| Level of service, LOS | C | |

Phone: Fax:
E-mail:

## Merge Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency/Co.: | Stantec |
| Date performed: | 6/15/16 |
| Analysis time period: | 3:00 - 4:00 PM |
| Freeway/Dir of Travel: | I-26 Eastbound |
| Junction: | Jedburg On-Ramp |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2039 Design Year |
| Description: | 171001612 - Build - 4k |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Merge | |
| Number of lanes in freeway | 3 | |
| Free-flow speed on freeway | 73.1 | mph |
| Volume on freeway | 4277 | 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 | 675 | vph |
| Length of first accel/decel lane | 1150 | ft |
| Length of second accel/decel lane | | ft |

## Adjacent Ramp Data (if one exists)

| | | |
|---|---|---|
| Does adjacent ramp exist? | Yes | |
| Volume on adjacent Ramp | 313 | vph |
| Position of adjacent Ramp | Upstream | |
| Type of adjacent Ramp | Off | |
| Distance to adjacent Ramp | 1620 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | Ramp | Adjacent Ramp | |
|---|---|---|---|---|
| Volume, V (vph) | 4277 | 675 | 313 | vph |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | |
| Peak 15-min volume, v15 | 1188 | 188 | 87 | v |
| Trucks and buses | 20 | 20 | 20 | % |
| 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 | 0.909 | 0.909 | 0.909 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 5227 | 825 | 383 | pcph |

## Estimation of V12 Merge Areas

$L_{EQ}$ = 1233.93 (Equation 13-6 or 13-7)

$P_{FM}$ = 0.610 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 3187 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{FO}$ | 6052 | 7200 | No |
| $v_3$ or $v_{av34}$ | 2040 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, $v_{12A}$ = 3187 (Equation 13-15, 13-16, 13-18, or 13-19)

## Flow Entering Merge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{12A}$ | 4012 | 4600 | No |

## Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 29.2 pc/mi/ln

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

## Speed Estimation

| | | |
|---|---|---|
| Intermediate speed variable, | $M_S$ = 0.456 | |
| Space mean speed in ramp influence area, | $S_R$ = 58.9 | mph |
| Space mean speed in outer lanes, | $S_O$ = 67.6 | mph |
| Space mean speed for all vehicles, | $S$ = 61.6 | mph |

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 6/15/16 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Eastbound |
| From/To: | East of Jedburg |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2039 Design Year |
| Description: | 171001612 - Build - 4k |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 4952 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 1376 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 2017 | pc/h/ln |

## Speed Inputs and Adjustments

| | | |
|---|---|---|
| Lane width | 12.0 | ft |
| Right-side lateral clearance | 6.0 | ft |
| Total ramp density, TRD | 1.17 | 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 | 3.7 | mi/h |
| Free-flow speed, FFS | 71.7 | mi/h |

## LOS and Performance Measures

| | | |
|---|---|---|
| Flow rate, vp | 2017 | pc/h/ln |
| Free-flow speed, FFS | 71.7 | mi/h |
| Average passenger-car speed, S | 62.3 | mi/h |
| Number of lanes, N | 3 | |
| Density, D | 32.4 | pc/mi/ln |
| Level of service, LOS | D | |

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 6/15/16 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Westbound |
| From/To: | East of Jedburg |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2039 Design Year |
| Description: | 171001612 - Build - 4k |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 4397 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 1221 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 1791 | 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 | 1791 | pc/h/ln |
| Free-flow speed, FFS | 71.3 | mi/h |
| Average passenger-car speed, S | 65.9 | mi/h |
| Number of lanes, N | 3 | |
| Density, D | 27.2 | pc/mi/ln |
| Level of service, LOS | D | |

HCS 2010: Freeway Merge and Diverge Segments Release 6.60

Phone: Fax:
E-mail:

## Diverge Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency/Co.: | Stantec |
| Date performed: | 6/15/16 |
| Analysis time period: | 3:00 - 4:00 PM |
| Freeway/Dir of Travel: | I-26 Westbound |
| Junction: | Jedburg Off-Ramp |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2039 Design Year |
| Description: | 171001612 - Build - 4k |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Diverge | |
| Number of lanes in freeway | 3 | |
| Free-flow speed on freeway | 71.3 | mph |
| Volume on freeway | 4397 | 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 | 421 | vph |
| Length of first accel/decel lane | 750 | ft |
| Length of second accel/decel lane | | ft |

## Adjacent Ramp Data (if one exists)

| | | |
|---|---|---|
| Does adjacent ramp exist? | Yes | |
| Volume on adjacent ramp | 626 | vph |
| Position of adjacent ramp | Downstream | |
| 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) | 4397 | 421 | 626 | vph |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | |
| Peak 15-min volume, v15 | 1221 | 117 | 174 | v |
| Trucks and buses | 20 | 20 | 20 | % |
| Recreational vehicles | 0 | 0 | 0 | % |
| Terrain type: | Level | Level | Level | |
| Grade | 0.00 % | 0.00 % | 0.00 % | |
| Length | 0.00 mi | 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 | 0.909 | 0.909 | 0.909 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 5374 | 515 | 765 | pcph |

## Estimation of V12 Diverge Areas

$L_{EQ}$ = 971.54 (Equation 13-12 or 13-13)

$P_{FD}$ = 0.630 Using Equation 7

$v_{12} = v_R + (v - v_F) P_{FD}$ = 3574 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{Fi} = v$ | 5374 | 7200 | No |
| $v_{FO} = v - v_R$ | 4859 | 7200 | No |
| $v_R$ | 515 | 2000 | No |
| $v_3$ or $v_{av34}$ | 1800 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, $v_{12A}$ = 3574 (Equation 13-15, 13-16, 13-18, or 13-19)

## Flow Entering Diverge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{12}$ | 3574 | 4400 | No |

## Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\ v_R - 0.009\ L_D$ = 28.2 pc/mi/ln

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

## Speed Estimation

| | | |
|---|---|---|
| Intermediate speed variable, | $D_S$ = 0.474 | |
| Space mean speed in ramp influence area, | $S_R$ = 57.4 | mph |
| Space mean speed in outer lanes, | $S_O$ = 75.1 | mph |
| Space mean speed for all vehicles, | $S$ = 62.3 | mph |

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 6/15/16 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Westbound |
| From/To: | Jedburg Off-Ramp to Loop Ramp |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2039 Design Year |
| Description: | 171001612 - Build - 4k |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 3976 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 1104 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 1620 | 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 | 1620 | pc/h/ln |
| Free-flow speed, FFS | 71.3 | mi/h |
| Average passenger-car speed, S | 68.0 | mi/h |
| Number of lanes, N | 3 | |
| Density, D | 23.8 | pc/mi/ln |
| Level of service, LOS | C | |

Phone: Fax:
E-mail:

## Diverge Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency/Co.: | Stantec |
| Date performed: | 6/15/16 |
| Analysis time period: | 3:00 - 4:00 PM |
| Freeway/Dir of Travel: | I-26 Westbound |
| Junction: | Jedburg Loop Off-Ramp |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2039 Design Year |
| Description: | 171001612 - Build - 4k |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Diverge | |
| Number of lanes in freeway | 3 | |
| Free-flow speed on freeway | 71.3 | mph |
| Volume on freeway | 3976 | 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 | 626 | vph |
| Length of first accel/decel lane | 750 | ft |
| Length of second accel/decel lane | | ft |

## Adjacent Ramp Data (if one exists)

| | | |
|---|---|---|
| Does adjacent ramp exist? | Yes | |
| Volume on adjacent ramp | 421 | 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) | 3976 | 626 | 421 | vph |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | |
| Peak 15-min volume, v15 | 1104 | 174 | 117 | v |
| Trucks and buses | 20 | 20 | 20 | % |
| Recreational vehicles | 0 | 0 | 0 | % |
| Terrain type: | Level | Level | Level | |
| Grade | 0.00 % | 0.00 % | 0.00 % | |
| Length | 0.00 mi | 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 | 0.909 | 0.909 | 0.909 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 4860 | 765 | 515 | pcph |

## Estimation of V12 Diverge Areas

$L_{EQ}$ = (Equation 13-12 or 13-13)

$P_{FD}$ = 0.603 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3236 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{Fi} = v_F$ | 4860 | 7200 | No |
| $v_{FO} = v_F - v_R$ | 4095 | 7200 | No |
| $v_R$ | 765 | 2000 | No |
| $v_3$ or $v_{av34}$ | 1624 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, $v_{12A}$ = 3236 (Equation 13-15, 13-16, 13-18, or 13-19)

## Flow Entering Diverge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{12}$ | 3236 | 4400 | No |

## Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, L_{12}$ = 25.3 pc/mi/ln

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

## Speed Estimation

| | | |
|---|---|---|
| Intermediate speed variable, | $D_S$ = 0.497 | |
| Space mean speed in ramp influence area, | $S_R$ = 56.7 | mph |
| Space mean speed in outer lanes, | $S_0$ = 75.8 | mph |
| Space mean speed for all vehicles, | $S$ = 61.9 | mph |

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 6/15/16 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Westbound |
| From/To: | Jedburg Loop Ramp to On-Ramp |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2039 Design Year |
| Description: | 171001612 - Build - 4k |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 3350 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 931 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 1365 | 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 | 1365 | pc/h/ln |
| Free-flow speed, FFS | 71.3 | mi/h |
| Average passenger-car speed, S | 69.7 | mi/h |
| Number of lanes, N | 3 | |
| Density, D | 19.6 | pc/mi/ln |
| Level of service, LOS | C | |

Phone: Fax:
E-mail:

## Merge Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency/Co.: | Stantec |
| Date performed: | 6/15/16 |
| Analysis time period: | 3:00 - 4:00 PM |
| Freeway/Dir of Travel: | I-26 Westbound |
| Junction: | Jedburg On-Ramp |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2039 Design Year |
| Description: | 171001612 - Build - 4k |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Merge | |
| Number of lanes in freeway | 3 | |
| Free-flow speed on freeway | 71.3 | mph |
| Volume on freeway | 3350 | 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 | 427 | vph |
| Length of first accel/decel lane | 1300 | ft |
| Length of second accel/decel lane | | ft |

## Adjacent Ramp Data (if one exists)

| | | |
|---|---|---|
| Does adjacent ramp exist? | Yes | |
| Volume on adjacent Ramp | 626 | vph |
| Position of adjacent Ramp | Upstream | |
| Type of adjacent Ramp | Off | |
| Distance to adjacent Ramp | 900 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | Ramp | Adjacent Ramp | |
|---|---|---|---|---|
| Volume, V (vph) | 3350 | 427 | 626 | vph |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | |
| Peak 15-min volume, v15 | 931 | 119 | 174 | v |
| Trucks and buses | 20 | 20 | 20 | % |
| 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 | 0.909 | 0.909 | 0.909 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 4094 | 522 | 765 | pcph |

## Estimation of V12 Merge Areas

$L_{EQ}$ = 993.22 (Equation 13-6 or 13-7)

$P_{FM}$ = 0.608 Using Equation 2

$v_{12} = v_F (P_{FM})$ = 2489 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{FO}$ | 4616 | 7200 | No |
| $v_3$ or $v_{av34}$ | 1605 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, $v_{12A}$ = 2489 (Equation 13-15, 13-16, 13-18, or 13-19)

## Flow Entering Merge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{12A}$ | 3011 | 4600 | No |

## Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 20.6 pc/mi/ln

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

## Speed Estimation

| | | |
|---|---|---|
| Intermediate speed variable, | $M_S$ = 0.309 | |
| Space mean speed in ramp influence area, | $S_R$ = 62.2 | mph |
| Space mean speed in outer lanes, | $S_O$ = 67.3 | mph |
| Space mean speed for all vehicles, | $S$ = 63.9 | mph |

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 6/15/16 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Westbound |
| From/To: | Jedburg to New Interchange |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2039 Design Year |
| Description: | 171001612 - Build - 4k |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 3777 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 1049 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 1539 | 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 | 1539 | pc/h/ln |
| Free-flow speed, FFS | 72.6 | mi/h |
| Average passenger-car speed, S | 71.8 | mi/h |
| Number of lanes, N | 3 | |
| Density, D | 21.4 | pc/mi/ln |
| Level of service, LOS | C | |

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 6/15/16 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Westbound |
| From/To: | New Interchange 1 Off Ramp |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2039 Design Year |
| Description: | 171001612 - Build - 4k |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 3777 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 1049 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 1154 | 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 | 4 | |
| Free-flow speed: | Base | |
| FFS 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 | 1154 | pc/h/ln |
| Free-flow speed, FFS | 72.6 | mi/h |
| Average passenger-car speed, S | 74.7 | mi/h |
| Number of lanes, N | 4 | |
| Density, D | 15.4 | pc/mi/ln |
| Level of service, LOS | B | |

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 6/15/16 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Westbound |
| From/To: | New Interchange 2 Off Ramp |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2039 Design Year |
| Description: | 171001612 - Build - 4k |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 3777 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 1049 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 923 | 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 | 5 | |
| Free-flow speed: | Base | |
| FFS 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 | 923 | pc/h/ln |
| Free-flow speed, FFS | 72.6 | mi/h |
| Average passenger-car speed, S | 75.0 | mi/h |
| Number of lanes, N | 5 | |
| Density, D | 12.3 | pc/mi/ln |
| Level of service, LOS | B | |

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 6/15/16 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Westbound |
| From/To: | New Interchange |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2039 Design Year |
| Description: | 171001612 - Build - 4k |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 3517 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 977 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| 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 | 0.83 | 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 | 1433 | pc/h/ln |
| Free-flow speed, FFS | 72.6 | mi/h |
| Average passenger-car speed, S | 72.9 | mi/h |
| Number of lanes, N | 3 | |
| Density, D | 19.7 | pc/mi/ln |
| Level of service, LOS | C | |

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 6/15/16 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Westbound |
| From/To: | New Interchange Off Ramp |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2039 Design Year |
| Description: | 171001612 - Build - 4k |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 3789 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 1053 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 1158 | 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 | 4 | |
| Free-flow speed: | Base | |
| FFS 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 | 1158 | pc/h/ln |
| Free-flow speed, FFS | 72.6 | mi/h |
| Average passenger-car speed, S | 74.7 | mi/h |
| Number of lanes, N | 4 | |
| Density, D | 15.5 | pc/mi/ln |
| Level of service, LOS | B | |

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 6/15/16 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Westbound |
| From/To: | New Interchange to SC 27 |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2039 Design Year |
| Description: | 171001612 - Build - 4k |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 3789 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 1053 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 1544 | 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 | 1544 | 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 | 21.5 | pc/mi/ln |
| Level of service, LOS | C | |

Phone: Fax:
E-mail:

## Diverge Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency/Co.: | Stantec |
| Date performed: | 6/15/16 |
| Analysis time period: | 3:00 - 4:00 PM |
| Freeway/Dir of Travel: | I-26 Westbound |
| Junction: | SC 27 Off-Ramp |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2039 Design Year |
| Description: | 171001612 - Build - 4k |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Diverge | |
| Number of lanes in freeway | 3 | |
| Free-flow speed on freeway | 73.1 | mph |
| Volume on freeway | 3789 | 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 | 611 | 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 | 2175 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | | Ramp | | Adjacent Ramp | | |
|---|---|---|---|---|---|---|---|
| Volume, V (vph) | 3789 | | 611 | | 155 | | vph |
| Peak-hour factor, PHF | 0.90 | | 0.90 | | 0.90 | | |
| Peak 15-min volume, v15 | 1053 | | 170 | | 43 | | v |
| Trucks and buses | 20 | | 20 | | 20 | | % |
| Recreational vehicles | 0 | | 0 | | 0 | | % |
| Terrain type: | Level | | Level | | Level | | |
| Grade | 0.00 | % | 0.00 | % | 0.00 | % | |
| Length | 0.00 | mi | 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 | 0.909 | 0.909 | 0.909 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 4631 | 747 | 189 | pcph |

## Estimation of V12 Diverge Areas

$L_{EQ}$ = (Equation 13-12 or 13-13)

$P_{FD}$ = 0.610 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3116 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{Fi} = v_F$ | 4631 | 7200 | No |
| $v_{FO} = v_F - v_R$ | 3884 | 7200 | No |
| $v_R$ | 747 | 2000 | No |
| $v_3$ or $v_{av34}$ | 1515 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, $v_{12A}$ = 3116 (Equation 13-15, 13-16, 13-18, or 13-19)

## Flow Entering Diverge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{12}$ | 3116 | 4400 | No |

## Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 26.5 pc/mi/ln

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

## Speed Estimation

Intermediate speed variable, $D_S$ = 0.495

Space mean speed in ramp influence area, $S_R$ = 57.7 mph

Space mean speed in outer lanes, $S_0$ = 78.2 mph

Space mean speed for all vehicles, $S$ = 63.1 mph

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 6/15/16 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Westbound |
| From/To: | SC 27 Interchange |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2039 Design Year |
| Description: | 171001612 - Build - 4k |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 3178 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 883 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 1295 | 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 | 1295 | pc/h/ln |
| Free-flow speed, FFS | 73.1 | mi/h |
| Average passenger-car speed, S | 74.0 | mi/h |
| Number of lanes, N | 3 | |
| Density, D | 17.5 | pc/mi/ln |
| Level of service, LOS | B | |

HCS 2010: Freeway Merge and Diverge Segments Release 6.60

Phone: Fax:
E-mail:

## Merge Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency/Co.: | Stantec |
| Date performed: | 6/15/16 |
| Analysis time period: | 3:00 - 4:00 PM |
| Freeway/Dir of Travel: | I-26 Westbound |
| Junction: | SC 27 On-Ramp |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2039 Design Year |
| Description: | 171001612 - Build - 4k |

## Freeway Data

| | | |
|---|---|---|
| Type of analysis | Merge | |
| Number of lanes in freeway | 3 | |
| Free-flow speed on freeway | 73.1 | mph |
| Volume on freeway | 3178 | 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 | 925 | ft |
| Length of second accel/decel lane | | ft |

## Adjacent Ramp Data (if one exists)

| | | |
|---|---|---|
| Does adjacent ramp exist? | Yes | |
| Volume on adjacent Ramp | 611 | vph |
| Position of adjacent Ramp | Upstream | |
| Type of adjacent Ramp | Off | |
| Distance to adjacent Ramp | 2175 | ft |

## Conversion to pc/h Under Base Conditions

| Junction Components | Freeway | Ramp | Adjacent Ramp | |
|---|---|---|---|---|
| Volume, V (vph) | 3178 | 155 | 611 | vph |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | |
| Peak 15-min volume, v15 | 883 | 43 | 170 | v |
| Trucks and buses | 20 | 20 | 20 | % |
| 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 | 0.909 | 0.909 | 0.909 | |
| Driver population factor, fP | 1.00 | 1.00 | 1.00 | |
| Flow rate, vp | 3884 | 189 | 747 | pcph |

## Estimation of V12 Merge Areas

$L_{EQ}$ = 710.52 (Equation 13-6 or 13-7)

$P_{FM}$ = 0.603 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 2344 pc/h

## Capacity Checks

| | Actual | Maximum | LOS F? |
|---|---|---|---|
| $v_{FO}$ | 4073 | 7200 | No |
| $v_3$ or $v_{av34}$ | 1540 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, $v_{12A}$ = 2344 (Equation 13-15, 13-16, 13-18, or 13-19)

## Flow Entering Merge Influence Area

| | Actual | Max Desirable | Violation? |
|---|---|---|---|
| $v_{12A}$ | 2533 | 4600 | No |

## Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 19.3 pc/mi/ln

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

## Speed Estimation

Intermediate speed variable, $M_S$ = 0.305

Space mean speed in ramp influence area, $S_R$ = 63.6 mph

Space mean speed in outer lanes, $S_O$ = 69.4 mph

Space mean speed for all vehicles, $S$ = 65.7 mph

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 6/15/16 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Westbound |
| From/To: | West of SC 27 |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2039 Design Year |
| Description: | 171001612 - Build - 4k |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 3333 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 926 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 1358 | 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 | 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 | 0.0 | mi/h |
| Free-flow speed, FFS | 75.4 | mi/h |

## LOS and Performance Measures

| | | |
|---|---|---|
| Flow rate, vp | 1358 | pc/h/ln |
| Free-flow speed, FFS | 75.4 | mi/h |
| Average passenger-car speed, S | 73.6 | mi/h |
| Number of lanes, N | 3 | |
| Density, D | 18.5 | pc/mi/ln |
| Level of service, LOS | C | |

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency or Company: | Stantec |
| Date Performed: | 6/15/16 |
| Analysis Time Period: | 3:00 - 4:00 PM |
| Freeway/Direction: | I-26 Westbound |
| From/To: | West of SC 27 |
| Jurisdiction: | SCDOT |
| Analysis Year: | 2039 Design Year |
| Description: | 171001612 - Build - 4k |

## Flow Inputs and Adjustments

| | | |
|---|---|---|
| Volume, V | 3333 | veh/h |
| Peak-hour factor, PHF | 0.90 | |
| Peak 15-min volume, v15 | 926 | v |
| Trucks and buses | 20 | % |
| Recreational vehicles | 0 | % |
| Terrain type: | Level | |
| Grade | - | % |
| Segment length | - | mi |
| Trucks and buses PCE, ET | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | |
| Driver population factor, fp | 1.00 | |
| Flow rate, vp | 2037 | pc/h/ln |

## Speed Inputs and Adjustments

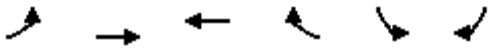
| | | |
|---|---|---|
| Lane width | 12.0 | ft |
| Right-side lateral clearance | 6.0 | ft |
| Total ramp density, TRD | 0.00 | ramps/mi |
| Number of lanes, N | 2 | |
| Free-flow speed: | Base | |
| FFS or BFFS | 75.4 | mi/h |
| Lane width adjustment, fLW | 0.0 | mi/h |
| Lateral clearance adjustment, 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 | 2037 | pc/h/ln |
| Free-flow speed, FFS | 75.4 | mi/h |
| Average passenger-car speed, S | 63.1 | mi/h |
| Number of lanes, N | 2 | |
| Density, D | 32.3 | pc/mi/ln |
| Level of service, LOS | D | |

# Appendix G

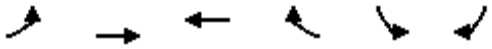
# 2039 Intersection Analysis Worksheets



| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 166 | 206 | 336 | 241 | 338 | 314 |
| Future Volume (vph) | 166 | 206 | 336 | 241 | 338 | 314 |
| Turn Type | pm+pt | NA | NA | pm+ov | Prot | pm+ov |
| Protected Phases | 5 | 2 | 6 | 4 | 4 | 5 |
| Permitted Phases | 2 | | | 6 | | 4 |
| Detector Phase | 5 | 2 | 6 | 4 | 4 | 5 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| Minimum Split (s) | 15.0 | 22.0 | 22.0 | 22.0 | 22.0 | 15.0 |
| Total Split (s) | 15.0 | 38.0 | 23.0 | 22.0 | 22.0 | 15.0 |
| Total Split (%) | 25.0% | 63.3% | 38.3% | 36.7% | 36.7% | 25.0% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | | Lag | | | Lead |
| Lead-Lag Optimize? | | | | | | |
| Recall Mode | None | Max | Max | Min | Min | None |
| Act Effct Green (s) | 32.0 | 32.0 | 17.7 | 39.7 | 16.0 | 30.3 |
| Actuated g/C Ratio | 0.53 | 0.53 | 0.30 | 0.66 | 0.27 | 0.50 |
| v/c Ratio | 0.47 | 0.27 | 0.80 | 0.27 | 0.94 | 0.45 |
| Control Delay | 11.9 | 8.7 | 36.0 | 1.4 | 57.4 | 6.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 11.9 | 8.7 | 36.0 | 1.4 | 57.4 | 6.1 |
| LOS | B | A | D | A | E | A |
| Approach Delay | | 10.1 | 21.5 | | 32.7 | |
| Approach LOS | | B | C | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 60 | |
| Actuated Cycle Length: 60 | |
| Natural Cycle: 60 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.94 | |
| Intersection Signal Delay: 23.4 | Intersection LOS: C |
| Intersection Capacity Utilization 60.6% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 101: US 78 & SC 27/Ridgeville Road



| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 166 | 206 | 336 | 241 | 338 | 314 |
| Future Volume (veh/h) | 166 | 206 | 336 | 241 | 338 | 314 |
| Number | 5 | 2 | 6 | 16 | 7 | 14 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | | 1.00 | 1.00 | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1583 | 1583 | 1583 | 1583 | 1583 | 1583 |
| Adj Flow Rate, veh/h | 184 | 229 | 373 | 268 | 376 | 349 |
| Adj No. of Lanes | 1 | 1 | 1 | 1 | 1 | 1 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | 20 | 20 | 20 | 20 | 20 | 20 |
| Cap, veh/h | 359 | 844 | 521 | 802 | 402 | 499 |
| Arrive On Green | 0.10 | 0.53 | 0.33 | 0.33 | 0.27 | 0.27 |
| Sat Flow, veh/h | 1508 | 1583 | 1583 | 1346 | 1508 | 1346 |
| Grp Volume(v), veh/h | 184 | 229 | 373 | 268 | 376 | 349 |
| Grp Sat Flow(s),veh/h/ln | 1508 | 1583 | 1583 | 1346 | 1508 | 1346 |
| Q Serve(g_s), s | 4.4 | 4.7 | 12.4 | 6.0 | 14.6 | 13.2 |
| Cycle Q Clear(g_c), s | 4.4 | 4.7 | 12.4 | 6.0 | 14.6 | 13.2 |
| Prop In Lane | 1.00 | | | 1.00 | 1.00 | 1.00 |
| Lane Grp Cap(c), veh/h | 359 | 844 | 521 | 802 | 402 | 499 |
| V/C Ratio(X) | 0.51 | 0.27 | 0.72 | 0.33 | 0.94 | 0.70 |
| Avail Cap(c_a), veh/h | 428 | 844 | 521 | 802 | 402 | 499 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 12.1 | 7.6 | 17.7 | 6.1 | 21.5 | 16.0 |
| Incr Delay (d2), s/veh | 1.1 | 0.8 | 8.2 | 1.1 | 29.0 | 4.3 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(95%),veh/ln | 3.5 | 4.0 | 10.8 | 7.2 | 14.3 | 15.2 |
| LnGrp Delay(d),s/veh | 13.2 | 8.4 | 25.9 | 7.2 | 50.5 | 20.3 |
| LnGrp LOS | B | A | C | A | D | C |
| Approach Vol, veh/h | | 413 | 641 | | 725 | |
| Approach Delay, s/veh | | 10.6 | 18.1 | | 36.0 | |
| Approach LOS | | B | B | | D | |

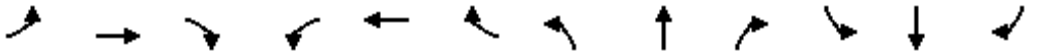
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | 5 | 6 | | |
| Phs Duration (G+Y+Rc), s | | 38.0 | | 22.0 | 12.3 | 25.7 | | |
| Change Period (Y+Rc), s | | 6.0 | | 6.0 | 6.0 | 6.0 | | |
| Max Green Setting (Gmax), s | | 32.0 | | 16.0 | 9.0 | 17.0 | | |
| Max Q Clear Time (g_c+I1), s | | 6.7 | | 16.6 | 6.4 | 14.4 | | |
| Green Ext Time (p_c), s | | 11.4 | | 0.0 | 0.1 | 1.8 | | |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 23.6 |
| HCM 2010 LOS | C |

| Lane Group | EBT | EBR | NBT | SBL | SBT |
|---|---|---|---|---|---|
| Lane Configurations | | | | | |
| Traffic Volume (vph) | 7 | 87 | 252 | 1512 | 565 |
| Future Volume (vph) | 7 | 87 | 252 | 1512 | 565 |
| Turn Type | NA | Perm | NA | pm+pt | NA |
| Protected Phases | 8 | | 6 | 5 | 2 |
| Permitted Phases | | 8 | | 2 | |
| Detector Phase | 8 | 8 | 6 | 5 | 2 |
| Switch Phase | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| Minimum Split (s) | 22.0 | 22.0 | 22.0 | 15.0 | 22.0 |
| Total Split (s) | 22.0 | 22.0 | 42.0 | 116.0 | 158.0 |
| Total Split (%) | 12.2% | 12.2% | 23.3% | 64.4% | 87.8% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | | | Lag | Lead | |
| Lead-Lag Optimize? | | | | | |
| Recall Mode | None | None | C-Min | None | C-Min |
| Act Effct Green (s) | 16.0 | 16.0 | 36.0 | 152.0 | 152.0 |
| Actuated g/C Ratio | 0.09 | 0.09 | 0.20 | 0.84 | 0.84 |
| v/c Ratio | 0.96 | 0.47 | 1.45 | 1.76 | 0.47 |
| Control Delay | 142.7 | 20.0 | 264.6 | 365.6 | 3.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.5 | 3.4 |
| Total Delay | 142.7 | 20.0 | 264.6 | 366.1 | 6.5 |
| LOS | F | B | F | F | A |
| Approach Delay | 92.7 | | 264.6 | | 268.3 |
| Approach LOS | F | | F | | F |

| Intersection Summary | |
|---|---|
| Cycle Length: 180 | |
| Actuated Cycle Length: 180 | |
| Offset: 48 (27%), Referenced to phase 2:SBTL and 6:NBT, Start of Yellow | |
| Natural Cycle: 150 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.76 | |
| Intersection Signal Delay: 253.8 | Intersection LOS: F |
| Intersection Capacity Utilization 128.7% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 102: SC 27/Ridgeville Road & I-26 EB Off-Ramp/I-26 EB On-Ramp



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 120 | 7 | 87 | 0 | 0 | 0 | 0 | 252 | 155 | 1512 | 565 | 0 |
| Future Volume (veh/h) | 120 | 7 | 87 | 0 | 0 | 0 | 0 | 252 | 155 | 1512 | 565 | 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 | 1647 | 1583 | | | | 0 | 1583 | 1900 | 1583 | 1583 | 0 |
| Adj Flow Rate, veh/h | 133 | 8 | 97 | | | | 0 | 280 | 172 | 1680 | 628 | 0 |
| Adj No. of Lanes | 0 | 1 | 1 | | | | 0 | 1 | 0 | 1 | 1 | 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, % | 20 | 20 | 20 | | | | 0 | 20 | 20 | 20 | 20 | 0 |
| Cap, veh/h | 132 | 8 | 120 | | | | 0 | 184 | 113 | 962 | 1337 | 0 |
| Arrive On Green | 0.09 | 0.09 | 0.09 | | | | 0.00 | 0.20 | 0.20 | 1.00 | 1.00 | 0.00 |
| Sat Flow, veh/h | 1483 | 89 | 1346 | | | | 0 | 919 | 565 | 1508 | 1583 | 0 |
| Grp Volume(v), veh/h | 141 | 0 | 97 | | | | 0 | 0 | 452 | 1680 | 628 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1573 | 0 | 1346 | | | | 0 | 0 | 1484 | 1508 | 1583 | 0 |
| Q Serve(g_s), s | 16.0 | 0.0 | 12.7 | | | | 0.0 | 0.0 | 36.0 | 110.0 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 16.0 | 0.0 | 12.7 | | | | 0.0 | 0.0 | 36.0 | 110.0 | 0.0 | 0.0 |
| Prop In Lane | 0.94 | | 1.00 | | | | 0.00 | | 0.38 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 140 | 0 | 120 | | | | 0 | 0 | 297 | 962 | 1337 | 0 |
| V/C Ratio(X) | 1.01 | 0.00 | 0.81 | | | | 0.00 | 0.00 | 1.52 | 1.75 | 0.47 | 0.00 |
| Avail Cap(c_a), veh/h | 140 | 0 | 120 | | | | 0 | 0 | 297 | 962 | 1337 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.67 | 1.67 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 0.00 | 1.00 | 0.09 | 0.09 | 0.00 |
| Uniform Delay (d), s/veh | 82.0 | 0.0 | 80.5 | | | | 0.0 | 0.0 | 72.0 | 3.9 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 78.4 | 0.0 | 32.8 | | | | 0.0 | 0.0 | 252.0 | 336.7 | 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(95%),veh/ln | 18.0 | 0.0 | 9.8 | | | | 0.0 | 0.0 | 63.9 | 217.3 | 0.1 | 0.0 |
| LnGrp Delay(d),s/veh | 160.5 | 0.0 | 113.3 | | | | 0.0 | 0.0 | 324.0 | 340.5 | 0.1 | 0.0 |
| LnGrp LOS | F | | F | | | | | | F | F | A | |
| Approach Vol, veh/h | | 238 | | | | | | 452 | | | 2308 | |
| Approach Delay, s/veh | | 141.2 | | | | | | 324.0 | | | 247.9 | |
| Approach LOS | | F | | | | | | F | | | F | |

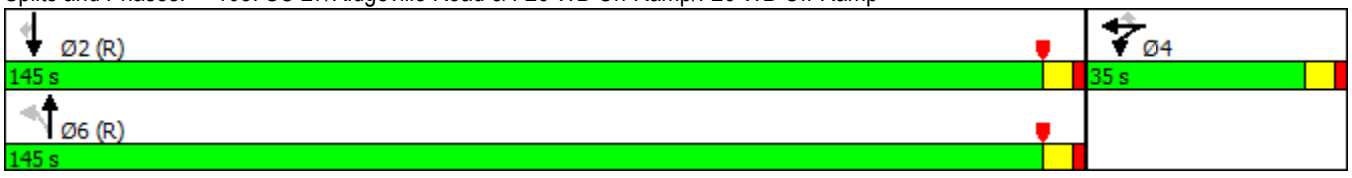
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | | 5 | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | 158.0 | | | 116.0 | 42.0 | | 22.0 |
| Change Period (Y+Rc), s | | 6.0 | | | 6.0 | 6.0 | | 6.0 |
| Max Green Setting (Gmax), s | | 152.0 | | | 110.0 | 36.0 | | 16.0 |
| Max Q Clear Time (g_c+I1), s | | 2.0 | | | 112.0 | 38.0 | | 18.0 |
| Green Ext Time (p_c), s | | 57.5 | | | 0.0 | 0.0 | | 0.0 |

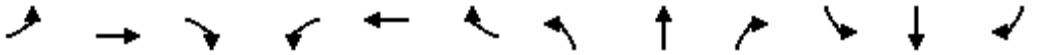
| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 250.9 |
| HCM 2010 LOS | F |

| Lane Group | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 4 | 555 | 55 | 317 | 1765 | 368 |
| Future Volume (vph) | 4 | 555 | 55 | 317 | 1765 | 368 |
| Turn Type | NA | Perm | Perm | NA | NA | Perm |
| Protected Phases | 4 | | | 6 | 2 | |
| Permitted Phases | | 4 | 6 | | | 2 |
| Detector Phase | 4 | 4 | 6 | 6 | 2 | 2 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| Minimum Split (s) | 22.0 | 22.0 | 22.0 | 22.0 | 22.0 | 22.0 |
| Total Split (s) | 35.0 | 35.0 | 145.0 | 145.0 | 145.0 | 145.0 |
| Total Split (%) | 19.4% | 19.4% | 80.6% | 80.6% | 80.6% | 80.6% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Recall Mode | None | None | C-Min | C-Min | C-Min | C-Min |
| Act Effct Green (s) | 29.0 | 29.0 | 139.0 | 139.0 | 139.0 | 139.0 |
| Actuated g/C Ratio | 0.16 | 0.16 | 0.77 | 0.77 | 0.77 | 0.77 |
| v/c Ratio | 1.31 | 0.85 | 1.74 | 0.29 | 1.60 | 0.38 |
| Control Delay | 220.0 | 17.0 | 377.3 | 10.0 | 298.0 | 5.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 2.1 | 0.0 |
| Total Delay | 220.0 | 17.0 | 377.3 | 10.0 | 300.1 | 5.0 |
| LOS | F | B | F | A | F | A |
| Approach Delay | 90.6 | | | 64.2 | 249.2 | |
| Approach LOS | F | | | E | F | |

| Intersection Summary | |
|---|---|
| Cycle Length: 180 | |
| Actuated Cycle Length: 180 | |
| Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBTL, Start of Yellow | |
| Natural Cycle: 150 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.74 | |
| Intersection Signal Delay: 187.9 | Intersection LOS: F |
| Intersection Capacity Utilization 128.7% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 103: SC 27/Ridgeville Road & I-26 WB On-Ramp/I-26 WB Off-Ramp





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 312 | 4 | 555 | 55 | 317 | 0 | 0 | 1765 | 368 |
| Future Volume (veh/h) | 0 | 0 | 0 | 312 | 4 | 555 | 55 | 317 | 0 | 0 | 1765 | 368 |
| 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 | 1647 | 1583 | 1583 | 1583 | 0 | 0 | 1583 | 1583 |
| Adj Flow Rate, veh/h | | | | 347 | 4 | 617 | 61 | 352 | 0 | 0 | 1961 | 409 |
| Adj No. of Lanes | | | | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 |
| Peak Hour Factor | | | | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | | | | 20 | 20 | 20 | 20 | 20 | 0 | 0 | 20 | 20 |
| Cap, veh/h | | | | 250 | 3 | 217 | 40 | 1223 | 0 | 0 | 1223 | 1039 |
| Arrive On Green | | | | 0.16 | 0.16 | 0.16 | 1.00 | 1.00 | 0.00 | 0.00 | 0.77 | 0.77 |
| Sat Flow, veh/h | | | | 1551 | 18 | 1346 | 126 | 1583 | 0 | 0 | 1583 | 1346 |
| Grp Volume(v), veh/h | | | | 351 | 0 | 617 | 61 | 352 | 0 | 0 | 1961 | 409 |
| Grp Sat Flow(s),veh/h/ln | | | | 1569 | 0 | 1346 | 126 | 1583 | 0 | 0 | 1583 | 1346 |
| Q Serve(g_s), s | | | | 29.0 | 0.0 | 29.0 | 0.0 | 0.0 | 0.0 | 0.0 | 139.0 | 17.9 |
| Cycle Q Clear(g_c), s | | | | 29.0 | 0.0 | 29.0 | 139.0 | 0.0 | 0.0 | 0.0 | 139.0 | 17.9 |
| Prop In Lane | | | | 0.99 | | 1.00 | 1.00 | | 0.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | | | | 253 | 0 | 217 | 40 | 1223 | 0 | 0 | 1223 | 1039 |
| V/C Ratio(X) | | | | 1.39 | 0.00 | 2.85 | 1.52 | 0.29 | 0.00 | 0.00 | 1.60 | 0.39 |
| Avail Cap(c_a), veh/h | | | | 253 | 0 | 217 | 40 | 1223 | 0 | 0 | 1223 | 1039 |
| HCM Platoon Ratio | | | | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | | | | 1.00 | 0.00 | 1.00 | 0.09 | 0.09 | 0.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | | | | 75.5 | 0.0 | 75.5 | 69.5 | 0.0 | 0.0 | 0.0 | 20.5 | 6.7 |
| Incr Delay (d2), s/veh | | | | 197.3 | 0.0 | 843.1 | 247.5 | 0.1 | 0.0 | 0.0 | 275.6 | 1.1 |
| Initial Q Delay(d3),s/veh | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(95%),veh/ln | | | | 47.6 | 0.0 | 110.8 | 8.5 | 0.0 | 0.0 | 0.0 | 276.1 | 11.2 |
| LnGrp Delay(d),s/veh | | | | 272.8 | 0.0 | 918.6 | 317.0 | 0.1 | 0.0 | 0.0 | 296.1 | 7.8 |
| LnGrp LOS | | | | F | | F | F | A | | | F | A |
| Approach Vol, veh/h | | | | | 968 | | | 413 | | | 2370 | |
| Approach Delay, s/veh | | | | | 684.5 | | | 46.9 | | | 246.3 | |
| Approach LOS | | | | | F | | | D | | | F | |

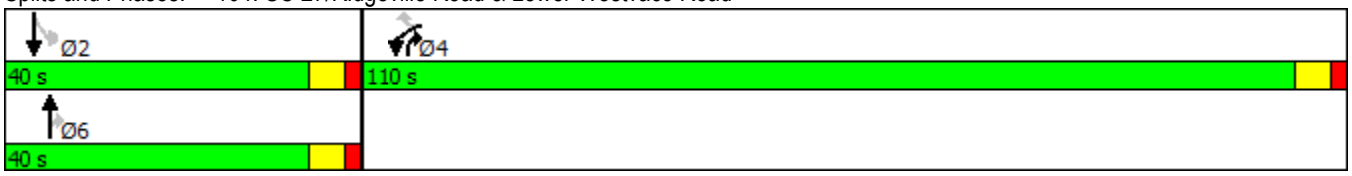
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | | 6 | | |
| Phs Duration (G+Y+Rc), s | | 145.0 | | 35.0 | | 145.0 | | |
| Change Period (Y+Rc), s | | 6.0 | | 6.0 | | 6.0 | | |
| Max Green Setting (Gmax), s | | 139.0 | | 29.0 | | 139.0 | | |
| Max Q Clear Time (g_c+I1), s | | 141.0 | | 31.0 | | 141.0 | | |
| Green Ext Time (p_c), s | | 0.0 | | 0.0 | | 0.0 | | |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 337.4 |
| HCM 2010 LOS | F |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 1894 | 10 | 421 | 451 | 10 | 239 |
| Future Volume (vph) | 1894 | 10 | 421 | 451 | 10 | 239 |
| Turn Type | Prot | Perm | NA | pm+ov | Perm | NA |
| Protected Phases | 4 | | 6 | 4 | | 2 |
| Permitted Phases | | 4 | | 6 | 2 | |
| Detector Phase | 4 | 4 | 6 | 4 | 2 | 2 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| Minimum Split (s) | 22.0 | 22.0 | 22.0 | 22.0 | 22.0 | 22.0 |
| Total Split (s) | 110.0 | 110.0 | 40.0 | 110.0 | 40.0 | 40.0 |
| Total Split (%) | 73.3% | 73.3% | 26.7% | 73.3% | 26.7% | 26.7% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Recall Mode | None | None | Max | None | Max | Max |
| Act Effct Green (s) | 104.0 | 104.0 | 34.0 | 150.0 | 34.0 | 34.0 |
| Actuated g/C Ratio | 0.69 | 0.69 | 0.23 | 1.00 | 0.23 | 0.23 |
| v/c Ratio | 2.02 | 0.01 | 1.31 | 0.37 | 0.26 | 0.74 |
| Control Delay | 482.7 | 6.3 | 201.7 | 0.8 | 66.1 | 67.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 482.7 | 6.3 | 201.7 | 0.8 | 66.1 | 67.8 |
| LOS | F | A | F | A | E | E |
| Approach Delay | 480.2 | | 97.8 | | | 67.7 |
| Approach LOS | F | | F | | | E |

| Intersection Summary | |
|---|---|
| Cycle Length: 150 | |
| Actuated Cycle Length: 150 | |
| Natural Cycle: 150 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 2.02 | |
| Intersection Signal Delay: 335.9 | Intersection LOS: F |
| Intersection Capacity Utilization 137.1% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 104: SC 27/Ridgeville Road & Lower Westvaco Road



| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 1894 | 10 | 421 | 451 | 10 | 239 |
| Future Volume (veh/h) | 1894 | 10 | 421 | 451 | 10 | 239 |
| Number | 7 | 14 | 6 | 16 | 5 | 2 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1583 | 1583 | 1583 | 1583 | 1583 | 1583 |
| Adj Flow Rate, veh/h | 2104 | 11 | 468 | 501 | 11 | 266 |
| Adj No. of Lanes | 1 | 1 | 1 | 1 | 1 | 1 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | 20 | 20 | 20 | 20 | 20 | 20 |
| Cap, veh/h | 1046 | 933 | 359 | 1238 | 48 | 359 |
| Arrive On Green | 0.69 | 0.69 | 0.23 | 0.23 | 0.23 | 0.23 |
| Sat Flow, veh/h | 1508 | 1346 | 1583 | 1346 | 491 | 1583 |
| Grp Volume(v), veh/h | 2104 | 11 | 468 | 501 | 11 | 266 |
| Grp Sat Flow(s),veh/h/ln | 1508 | 1346 | 1583 | 1346 | 491 | 1583 |
| Q Serve(g_s), s | 104.0 | 0.4 | 34.0 | 7.1 | 0.0 | 23.4 |
| Cycle Q Clear(g_c), s | 104.0 | 0.4 | 34.0 | 7.1 | 34.0 | 23.4 |
| Prop In Lane | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Lane Grp Cap(c), veh/h | 1046 | 933 | 359 | 1238 | 48 | 359 |
| V/C Ratio(X) | 2.01 | 0.01 | 1.30 | 0.40 | 0.23 | 0.74 |
| Avail Cap(c_a), veh/h | 1046 | 933 | 359 | 1238 | 48 | 359 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 23.0 | 7.1 | 58.0 | 0.8 | 75.0 | 53.9 |
| Incr Delay (d2), s/veh | 459.0 | 0.0 | 155.7 | 1.0 | 10.8 | 12.9 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(95%),veh/ln | 315.3 | 0.3 | 54.7 | 28.6 | 1.1 | 17.1 |
| LnGrp Delay(d),s/veh | 482.0 | 7.1 | 213.7 | 1.7 | 85.8 | 66.8 |
| LnGrp LOS | F | A | F | A | F | E |
| Approach Vol, veh/h | 2115 | | 969 | | | 277 |
| Approach Delay, s/veh | 479.5 | | 104.1 | | | 67.6 |
| Approach LOS | F | | F | | | E |

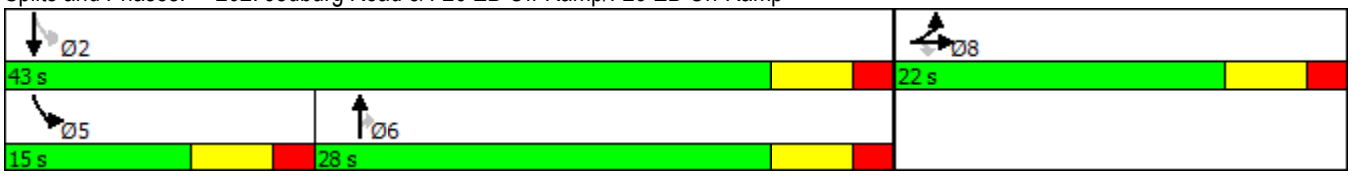
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | | 6 | | |
| Phs Duration (G+Y+Rc), s | | 40.0 | | 110.0 | | 40.0 | | |
| Change Period (Y+Rc), s | | 6.0 | | 6.0 | | 6.0 | | |
| Max Green Setting (Gmax), s | | 34.0 | | 104.0 | | 34.0 | | |
| Max Q Clear Time (g_c+I1), s | | 36.0 | | 106.0 | | 36.0 | | |
| Green Ext Time (p_c), s | | 0.0 | | 0.0 | | 0.0 | | |

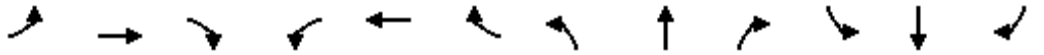
| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 337.3 |
| HCM 2010 LOS | F |

| Lane Group | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 0 | 173 | 821 | 443 | 232 | 1004 |
| Future Volume (vph) | 0 | 173 | 821 | 443 | 232 | 1004 |
| Turn Type | NA | Perm | NA | Perm | pm+pt | NA |
| Protected Phases | 8 | | 6 | | 5 | 2 |
| Permitted Phases | | 8 | | 6 | 2 | |
| Detector Phase | 8 | 8 | 6 | 6 | 5 | 2 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| Minimum Split (s) | 22.0 | 22.0 | 22.0 | 22.0 | 15.0 | 22.0 |
| Total Split (s) | 22.0 | 22.0 | 28.0 | 28.0 | 15.0 | 43.0 |
| Total Split (%) | 33.8% | 33.8% | 43.1% | 43.1% | 23.1% | 66.2% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | | | Lag | Lag | Lead | |
| Lead-Lag Optimize? | | | | | | |
| Recall Mode | None | None | Max | Max | None | Max |
| Act Effct Green (s) | 11.3 | 11.3 | 22.1 | 22.1 | 37.1 | 37.1 |
| Actuated g/C Ratio | 0.19 | 0.19 | 0.37 | 0.37 | 0.61 | 0.61 |
| v/c Ratio | 0.56 | 0.51 | 0.83 | 0.67 | 0.76 | 0.60 |
| Control Delay | 30.1 | 11.9 | 26.8 | 9.9 | 27.4 | 9.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 30.1 | 11.9 | 26.8 | 9.9 | 27.4 | 9.5 |
| LOS | C | B | C | A | C | A |
| Approach Delay | 20.0 | | 20.9 | | | 12.9 |
| Approach LOS | C | | C | | | B |

| Intersection Summary | |
|---|---|
| Cycle Length: 65 | |
| Actuated Cycle Length: 60.4 | |
| Natural Cycle: 65 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.83 | |
| Intersection Signal Delay: 17.3 | Intersection LOS: B |
| Intersection Capacity Utilization 63.0% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 202: Jedburg Road & I-26 EB Off-Ramp/I-26 EB On-Ramp





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 140 | 0 | 173 | 0 | 0 | 0 | 0 | 821 | 443 | 232 | 1004 | 0 |
| Future Volume (veh/h) | 140 | 0 | 173 | 0 | 0 | 0 | 0 | 821 | 443 | 232 | 1004 | 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 | 1583 | 1583 | | | | 0 | 1583 | 1583 | 1583 | 1583 | 0 |
| Adj Flow Rate, veh/h | 156 | 0 | 0 | | | | 0 | 912 | 0 | 258 | 1116 | 0 |
| Adj No. of Lanes | 0 | 1 | 1 | | | | 0 | 2 | 1 | 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, % | 20 | 20 | 20 | | | | 0 | 20 | 20 | 20 | 20 | 0 |
| Cap, veh/h | 194 | 0 | 173 | | | | 0 | 1292 | 578 | 406 | 1979 | 0 |
| Arrive On Green | 0.13 | 0.00 | 0.00 | | | | 0.00 | 0.43 | 0.00 | 0.12 | 0.66 | 0.00 |
| Sat Flow, veh/h | 1508 | 0 | 1346 | | | | 0 | 3088 | 1346 | 1508 | 3088 | 0 |
| Grp Volume(v), veh/h | 156 | 0 | 0 | | | | 0 | 912 | 0 | 258 | 1116 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1508 | 0 | 1346 | | | | 0 | 1504 | 1346 | 1508 | 1504 | 0 |
| Q Serve(g_s), s | 5.7 | 0.0 | 0.0 | | | | 0.0 | 14.0 | 0.0 | 4.8 | 11.3 | 0.0 |
| Cycle Q Clear(g_c), s | 5.7 | 0.0 | 0.0 | | | | 0.0 | 14.0 | 0.0 | 4.8 | 11.3 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | | | | 0.00 | | 1.00 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 194 | 0 | 173 | | | | 0 | 1292 | 578 | 406 | 1979 | 0 |
| V/C Ratio(X) | 0.80 | 0.00 | 0.00 | | | | 0.00 | 0.71 | 0.00 | 0.64 | 0.56 | 0.00 |
| Avail Cap(c_a), veh/h | 429 | 0 | 383 | | | | 0 | 1292 | 578 | 463 | 1979 | 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 | 23.8 | 0.0 | 0.0 | | | | 0.0 | 13.1 | 0.0 | 10.0 | 5.2 | 0.0 |
| Incr Delay (d2), s/veh | 7.6 | 0.0 | 0.0 | | | | 0.0 | 3.3 | 0.0 | 2.3 | 1.2 | 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(95%),veh/ln | 4.9 | 0.0 | 0.0 | | | | 0.0 | 10.4 | 0.0 | 3.8 | 8.6 | 0.0 |
| LnGrp Delay(d),s/veh | 31.4 | 0.0 | 0.0 | | | | 0.0 | 16.4 | 0.0 | 12.4 | 6.4 | 0.0 |
| LnGrp LOS | C | | | | | | | B | | B | A | |
| Approach Vol, veh/h | | 156 | | | | | | 912 | | | 1374 | |
| Approach Delay, s/veh | | 31.4 | | | | | | 16.4 | | | 7.5 | |
| Approach LOS | | C | | | | | | B | | | A | |

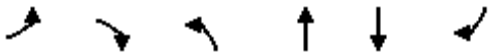
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | | 5 | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | 43.0 | | | 12.9 | 30.1 | | 13.2 |
| Change Period (Y+Rc), s | | 6.0 | | | 6.0 | 6.0 | | 6.0 |
| Max Green Setting (Gmax), s | | 37.0 | | | 9.0 | 22.0 | | 16.0 |
| Max Q Clear Time (g_c+I1), s | | 13.3 | | | 6.8 | 16.0 | | 7.7 |
| Green Ext Time (p_c), s | | 23.1 | | | 0.2 | 6.0 | | 0.3 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 12.4 |
| HCM 2010 LOS | B |

| Lane Group | NBL | NBT | SBT |
|---|---|---|---|
| Lane Configurations | | | |
| Traffic Volume (vph) | 243 | 718 | 610 |
| Future Volume (vph) | 243 | 718 | 610 |
| Turn Type | D.P+P | NA | NA |
| Protected Phases | 1 | Free | 2 |
| Permitted Phases | 2 | | |
| Detector Phase | 1 | | 2 |
| Switch Phase | | | |
| Minimum Initial (s) | 4.0 | | 4.0 |
| Minimum Split (s) | 15.0 | | 22.0 |
| Total Split (s) | 22.0 | | 38.0 |
| Total Split (%) | 36.7% | | 63.3% |
| Yellow Time (s) | 4.0 | | 4.0 |
| All-Red Time (s) | 2.0 | | 2.0 |
| Lost Time Adjust (s) | 0.0 | | 0.0 |
| Total Lost Time (s) | 6.0 | | 6.0 |
| Lead/Lag | Lead | | Lag |
| Lead-Lag Optimize? | | | |
| Recall Mode | None | | Max |
| Act Effct Green (s) | 39.4 | 51.4 | 32.0 |
| Actuated g/C Ratio | 0.77 | 1.00 | 0.62 |
| v/c Ratio | 0.51 | 0.27 | 0.48 |
| Control Delay | 5.5 | 0.2 | 5.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 |
| Total Delay | 5.5 | 0.2 | 5.8 |
| LOS | A | A | A |
| Approach Delay | | 1.6 | 5.8 |
| Approach LOS | | A | A |

| Intersection Summary | |
|---|---|
| Cycle Length: 60 | |
| Actuated Cycle Length: 51.4 | |
| Natural Cycle: 40 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.51 | |
| Intersection Signal Delay: 3.5 | Intersection LOS: A |
| Intersection Capacity Utilization 62.3% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 203: Jedburg Road & I-26 WB On-Ramp



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 0 | 0 | 243 | 718 | 610 | 184 |
| Future Volume (vph) | 0 | 0 | 243 | 718 | 610 | 184 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | | 6.0 | 4.0 | 6.0 | |
| Lane Util. Factor | | | 1.00 | 0.95 | 0.95 | |
| Frt | | | 1.00 | 1.00 | 0.97 | |
| Flt Protected | | | 0.95 | 1.00 | 1.00 | |
| Satd. Flow (prot) | | | 1504 | 3008 | 2904 | |
| Flt Permitted | | | 0.31 | 1.00 | 1.00 | |
| Satd. Flow (perm) | | | 498 | 3008 | 2904 | |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 0 | 0 | 270 | 798 | 678 | 204 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 38 | 0 |
| Lane Group Flow (vph) | 0 | 0 | 270 | 798 | 844 | 0 |
| Turn Type | | | D.P+P | NA | NA | |
| Protected Phases | | | 1 | Free | 2 | |
| Permitted Phases | | | 2 | | | |
| Actuated Green, G (s) | | | 39.4 | 51.4 | 32.0 | |
| Effective Green, g (s) | | | 39.4 | 51.4 | 32.0 | |
| Actuated g/C Ratio | | | 0.77 | 1.00 | 0.62 | |
| Clearance Time (s) | | | 6.0 | | 6.0 | |
| Vehicle Extension (s) | | | 3.0 | | 3.0 | |
| Lane Grp Cap (vph) | | | 526 | 3008 | 1807 | |
| v/s Ratio Prot | | | c0.07 | 0.27 | 0.29 | |
| v/s Ratio Perm | | | c0.32 | | | |
| v/c Ratio | | | 0.51 | 0.27 | 0.47 | |
| Uniform Delay, d1 | | | 1.7 | 0.0 | 5.2 | |
| Progression Factor | | | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | | | 0.8 | 0.2 | 0.9 | |
| Delay (s) | | | 2.6 | 0.2 | 6.0 | |
| Level of Service | | | A | A | A | |
| Approach Delay (s) | 0.0 | | | 0.8 | 6.0 | |
| Approach LOS | A | | | A | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 3.2 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.51 | | |
| Actuated Cycle Length (s) | 51.4 | Sum of lost time (s) | 12.0 |
| Intersection Capacity Utilization | 62.3% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

HCM 2010 analysis expects strict NEMA phasing.

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 120 | 10 | 10 | 1080 | 10 | 10 |
| Future Volume (vph) | 120 | 10 | 10 | 1080 | 10 | 10 |
| Turn Type | Prot | Perm | NA | Free | Perm | NA |
| Protected Phases | 6 | | 8 | | | 4 |
| Permitted Phases | | 6 | | Free | 4 | |
| Detector Phase | 6 | 6 | 8 | | 4 | 4 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 |
| Minimum Split (s) | 15.0 | 15.0 | 22.0 | | 22.0 | 22.0 |
| Total Split (s) | 34.0 | 34.0 | 26.0 | | 26.0 | 26.0 |
| Total Split (%) | 56.7% | 56.7% | 43.3% | | 43.3% | 43.3% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | | 6.0 | 6.0 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Recall Mode | Min | Min | None | | None | None |
| Act Effct Green (s) | 25.7 | 25.7 | 5.8 | 28.7 | 5.9 | 5.9 |
| Actuated g/C Ratio | 0.90 | 0.90 | 0.20 | 1.00 | 0.21 | 0.21 |
| v/c Ratio | 0.08 | 0.01 | 0.03 | 0.76 | 0.03 | 0.03 |
| Control Delay | 2.4 | 2.2 | 10.8 | 3.8 | 10.8 | 10.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 2.4 | 2.2 | 10.8 | 3.8 | 10.8 | 10.8 |
| LOS | A | A | B | A | B | B |
| Approach Delay | 2.4 | | 3.9 | | | 10.8 |
| Approach LOS | A | | A | | | B |

| Intersection Summary | |
|---|---|
| Cycle Length: 60 | |
| Actuated Cycle Length: 28.7 | |
| Natural Cycle: 40 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.76 | |
| Intersection Signal Delay: 3.8 | Intersection LOS: A |
| Intersection Capacity Utilization 23.9% | ICU Level of Service A |
| Analysis Period (min) 15 | |

Splits and Phases: 301: Factory Entrance/Welcome Center & Volvo Car Drive

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 120 | 10 | 10 | 1080 | 10 | 10 |
| Future Volume (veh/h) | 120 | 10 | 10 | 1080 | 10 | 10 |
| Number | 1 | 16 | 8 | 18 | 7 | 4 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 133 | 11 | 11 | 0 | 11 | 11 |
| Adj No. of Lanes | 1 | 1 | 1 | 1 | 1 | 1 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 428 | 382 | 63 | 54 | 474 | 63 |
| Arrive On Green | 0.24 | 0.24 | 0.03 | 0.00 | 0.03 | 0.03 |
| Sat Flow, veh/h | 1774 | 1583 | 1863 | 1583 | 1398 | 1863 |
| Grp Volume(v), veh/h | 133 | 11 | 11 | 0 | 11 | 11 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 1583 | 1863 | 1583 | 1398 | 1863 |
| Q Serve(g_s), s | 1.0 | 0.1 | 0.1 | 0.0 | 0.1 | 0.1 |
| Cycle Q Clear(g_c), s | 1.0 | 0.1 | 0.1 | 0.0 | 0.2 | 0.1 |
| Prop In Lane | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Lane Grp Cap(c), veh/h | 428 | 382 | 63 | 54 | 474 | 63 |
| V/C Ratio(X) | 0.31 | 0.03 | 0.17 | 0.00 | 0.02 | 0.17 |
| Avail Cap(c_a), veh/h | 2999 | 2677 | 2249 | 1912 | 2114 | 2249 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 5.2 | 4.8 | 7.8 | 0.0 | 7.9 | 7.8 |
| Incr Delay (d2), s/veh | 0.4 | 0.0 | 1.3 | 0.0 | 0.0 | 1.3 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(95%),veh/ln | 1.0 | 0.1 | 0.1 | 0.0 | 0.1 | 0.1 |
| LnGrp Delay(d),s/veh | 5.6 | 4.8 | 9.1 | 0.0 | 7.9 | 9.1 |
| LnGrp LOS | A | A | A | | A | A |
| Approach Vol, veh/h | 144 | | 11 | | | 22 |
| Approach Delay, s/veh | 5.5 | | 9.1 | | | 8.5 |
| Approach LOS | A | | A | | | A |

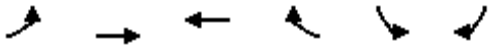
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | | | 4 | | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | | | 6.6 | | 10.0 | | 6.6 |
| Change Period (Y+Rc), s | | | | 6.0 | | 6.0 | | 6.0 |
| Max Green Setting (Gmax), s | | | | 20.0 | | 28.0 | | 20.0 |
| Max Q Clear Time (g_c+I1), s | | | | 2.2 | | 3.0 | | 2.1 |
| Green Ext Time (p_c), s | | | | 0.0 | | 0.4 | | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 6.1 |
| HCM 2010 LOS | A |

| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 166 | 206 | 336 | 241 | 338 | 314 |
| Future Volume (vph) | 166 | 206 | 336 | 241 | 338 | 314 |
| Turn Type | pm+pt | NA | NA | pm+ov | Prot | pm+ov |
| Protected Phases | 5 | 2 | 6 | 4 | 4 | 5 |
| Permitted Phases | 2 | | | 6 | | 4 |
| Detector Phase | 5 | 2 | 6 | 4 | 4 | 5 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| Minimum Split (s) | 15.0 | 22.0 | 22.0 | 22.0 | 22.0 | 15.0 |
| Total Split (s) | 15.0 | 38.0 | 23.0 | 22.0 | 22.0 | 15.0 |
| Total Split (%) | 25.0% | 63.3% | 38.3% | 36.7% | 36.7% | 25.0% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | | Lag | | | Lead |
| Lead-Lag Optimize? | | | | | | |
| Recall Mode | None | Max | Max | Min | Min | None |
| Act Effct Green (s) | 32.0 | 32.0 | 17.7 | 39.7 | 16.0 | 30.3 |
| Actuated g/C Ratio | 0.53 | 0.53 | 0.30 | 0.66 | 0.27 | 0.50 |
| v/c Ratio | 0.47 | 0.27 | 0.80 | 0.27 | 0.94 | 0.45 |
| Control Delay | 11.9 | 8.7 | 36.0 | 1.4 | 57.4 | 6.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 11.9 | 8.7 | 36.0 | 1.4 | 57.4 | 6.1 |
| LOS | B | A | D | A | E | A |
| Approach Delay | | 10.1 | 21.5 | | 32.7 | |
| Approach LOS | | B | C | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 60 | |
| Actuated Cycle Length: 60 | |
| Natural Cycle: 60 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.94 | |
| Intersection Signal Delay: 23.4 | Intersection LOS: C |
| Intersection Capacity Utilization 60.6% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 101: US 78 & SC 27/Ridgeville Road



| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 166 | 206 | 336 | 241 | 338 | 314 |
| Future Volume (veh/h) | 166 | 206 | 336 | 241 | 338 | 314 |
| Number | 5 | 2 | 6 | 16 | 7 | 14 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | | 1.00 | 1.00 | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1583 | 1583 | 1583 | 1583 | 1583 | 1583 |
| Adj Flow Rate, veh/h | 184 | 229 | 373 | 268 | 376 | 349 |
| Adj No. of Lanes | 1 | 1 | 1 | 1 | 1 | 1 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | 20 | 20 | 20 | 20 | 20 | 20 |
| Cap, veh/h | 359 | 844 | 521 | 802 | 402 | 499 |
| Arrive On Green | 0.10 | 0.53 | 0.33 | 0.33 | 0.27 | 0.27 |
| Sat Flow, veh/h | 1508 | 1583 | 1583 | 1346 | 1508 | 1346 |
| Grp Volume(v), veh/h | 184 | 229 | 373 | 268 | 376 | 349 |
| Grp Sat Flow(s),veh/h/ln | 1508 | 1583 | 1583 | 1346 | 1508 | 1346 |
| Q Serve(g_s), s | 4.4 | 4.7 | 12.4 | 6.0 | 14.6 | 13.2 |
| Cycle Q Clear(g_c), s | 4.4 | 4.7 | 12.4 | 6.0 | 14.6 | 13.2 |
| Prop In Lane | 1.00 | | | 1.00 | 1.00 | 1.00 |
| Lane Grp Cap(c), veh/h | 359 | 844 | 521 | 802 | 402 | 499 |
| V/C Ratio(X) | 0.51 | 0.27 | 0.72 | 0.33 | 0.94 | 0.70 |
| Avail Cap(c_a), veh/h | 428 | 844 | 521 | 802 | 402 | 499 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 12.1 | 7.6 | 17.7 | 6.1 | 21.5 | 16.0 |
| Incr Delay (d2), s/veh | 1.1 | 0.8 | 8.2 | 1.1 | 29.0 | 4.3 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.0 | 2.2 | 6.6 | 4.0 | 9.3 | 10.0 |
| LnGrp Delay(d),s/veh | 13.2 | 8.4 | 25.9 | 7.2 | 50.5 | 20.3 |
| LnGrp LOS | B | A | C | A | D | C |
| Approach Vol, veh/h | | 413 | 641 | | 725 | |
| Approach Delay, s/veh | | 10.6 | 18.1 | | 36.0 | |
| Approach LOS | | B | B | | D | |

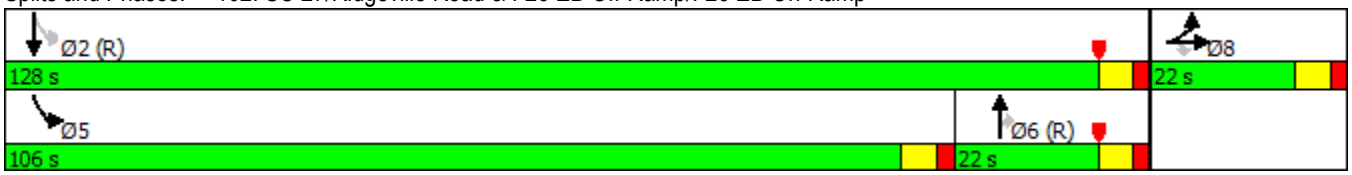
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | 5 | 6 | | |
| Phs Duration (G+Y+Rc), s | | 38.0 | | 22.0 | 12.3 | 25.7 | | |
| Change Period (Y+Rc), s | | 6.0 | | 6.0 | 6.0 | 6.0 | | |
| Max Green Setting (Gmax), s | | 32.0 | | 16.0 | 9.0 | 17.0 | | |
| Max Q Clear Time (g_c+I1), s | | 6.7 | | 16.6 | 6.4 | 14.4 | | |
| Green Ext Time (p_c), s | | 11.4 | | 0.0 | 0.1 | 1.8 | | |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 23.6 |
| HCM 2010 LOS | C |

| Lane Group | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 7 | 87 | 252 | 155 | 1512 | 565 |
| Future Volume (vph) | 7 | 87 | 252 | 155 | 1512 | 565 |
| Turn Type | NA | Perm | NA | Perm | pm+pt | NA |
| Protected Phases | 8 | | 6 | | 5 | 2 |
| Permitted Phases | | 8 | | 6 | 2 | |
| Detector Phase | 8 | 8 | 6 | 6 | 5 | 2 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| Minimum Split (s) | 22.0 | 22.0 | 22.0 | 22.0 | 15.0 | 22.0 |
| Total Split (s) | 22.0 | 22.0 | 22.0 | 22.0 | 106.0 | 128.0 |
| Total Split (%) | 14.7% | 14.7% | 14.7% | 14.7% | 70.7% | 85.3% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | | | Lag | Lag | Lead | |
| Lead-Lag Optimize? | | | | | | |
| Recall Mode | None | None | C-Max | C-Max | None | C-Max |
| Act Effct Green (s) | 14.1 | 14.1 | 16.0 | 16.0 | 123.9 | 123.9 |
| Actuated g/C Ratio | 0.09 | 0.09 | 0.11 | 0.11 | 0.83 | 0.83 |
| v/c Ratio | 0.90 | 0.45 | 0.88 | 0.58 | 1.55 | 0.25 |
| Control Delay | 116.3 | 18.0 | 92.4 | 16.6 | 265.3 | 1.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 116.3 | 18.0 | 92.4 | 16.6 | 265.3 | 1.6 |
| LOS | F | B | F | B | F | A |
| Approach Delay | 76.2 | | 63.5 | | | 193.6 |
| Approach LOS | E | | E | | | F |

| Intersection Summary | |
|---|---|
| Cycle Length: 150 | |
| Actuated Cycle Length: 150 | |
| Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBT, Start of Yellow, Master Intersection | |
| Natural Cycle: 150 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.55 | |
| Intersection Signal Delay: 164.7 | Intersection LOS: F |
| Intersection Capacity Utilization 112.1% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 102: SC 27/Ridgeville Road & I-26 EB Off-Ramp/I-26 EB On-Ramp



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 120 | 7 | 87 | 0 | 0 | 0 | 0 | 252 | 155 | 1512 | 565 | 0 |
| Future Volume (veh/h) | 120 | 7 | 87 | 0 | 0 | 0 | 0 | 252 | 155 | 1512 | 565 | 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 | 1647 | 1583 | | | | 0 | 1583 | 1583 | 1583 | 1583 | 0 |
| Adj Flow Rate, veh/h | 133 | 8 | 97 | | | | 0 | 280 | 172 | 1680 | 628 | 0 |
| Adj No. of Lanes | 0 | 1 | 1 | | | | 0 | 2 | 1 | 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, % | 20 | 20 | 20 | | | | 0 | 20 | 20 | 20 | 20 | 0 |
| Cap, veh/h | 153 | 9 | 138 | | | | 0 | 332 | 149 | 1069 | 2458 | 0 |
| Arrive On Green | 0.10 | 0.10 | 0.10 | | | | 0.00 | 0.11 | 0.11 | 1.00 | 1.00 | 0.00 |
| Sat Flow, veh/h | 1483 | 89 | 1346 | | | | 0 | 3088 | 1346 | 1508 | 3088 | 0 |
| Grp Volume(v), veh/h | 141 | 0 | 97 | | | | 0 | 280 | 172 | 1680 | 628 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1573 | 0 | 1346 | | | | 0 | 1504 | 1346 | 1508 | 1504 | 0 |
| Q Serve(g_s), s | 13.3 | 0.0 | 10.5 | | | | 0.0 | 13.7 | 16.6 | 100.0 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 13.3 | 0.0 | 10.5 | | | | 0.0 | 13.7 | 16.6 | 100.0 | 0.0 | 0.0 |
| Prop In Lane | 0.94 | | 1.00 | | | | 0.00 | | 1.00 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 162 | 0 | 138 | | | | 0 | 332 | 149 | 1069 | 2458 | 0 |
| V/C Ratio(X) | 0.87 | 0.00 | 0.70 | | | | 0.00 | 0.84 | 1.16 | 1.57 | 0.26 | 0.00 |
| Avail Cap(c_a), veh/h | 168 | 0 | 144 | | | | 0 | 332 | 149 | 1069 | 2458 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.67 | 1.67 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 1.00 | 1.00 | 0.09 | 0.09 | 0.00 |
| Uniform Delay (d), s/veh | 66.3 | 0.0 | 65.0 | | | | 0.0 | 65.4 | 66.7 | 4.0 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 35.2 | 0.0 | 13.6 | | | | 0.0 | 22.1 | 122.3 | 257.9 | 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 | 7.3 | 0.0 | 4.4 | | | | 0.0 | 6.7 | 11.2 | 113.5 | 0.0 | 0.0 |
| LnGrp Delay(d),s/veh | 101.5 | 0.0 | 78.6 | | | | 0.0 | 87.6 | 189.0 | 262.0 | 0.0 | 0.0 |
| LnGrp LOS | F | | E | | | | | F | F | F | A | |
| Approach Vol, veh/h | | 238 | | | | | | 452 | | | 2308 | |
| Approach Delay, s/veh | | 92.2 | | | | | | 126.2 | | | 190.7 | |
| Approach LOS | | F | | | | | | F | | | F | |

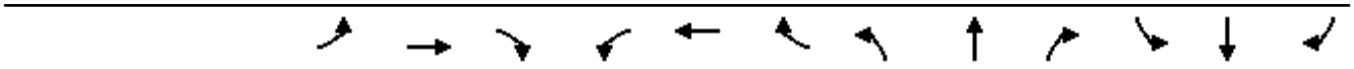
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | | 5 | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | 128.6 | | | 106.0 | 22.6 | | 21.4 |
| Change Period (Y+Rc), s | | 6.0 | | | 6.0 | 6.0 | | 6.0 |
| Max Green Setting (Gmax), s | | 122.0 | | | 100.0 | 16.0 | | 16.0 |
| Max Q Clear Time (g_c+I1), s | | 2.0 | | | 102.0 | 18.6 | | 15.3 |
| Green Ext Time (p_c), s | | 37.6 | | | 0.0 | 0.0 | | 0.2 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 173.2 |
| HCM 2010 LOS | F |

| Lane Group | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 4 | 555 | 55 | 317 | 1765 | 368 |
| Future Volume (vph) | 4 | 555 | 55 | 317 | 1765 | 368 |
| Turn Type | NA | Perm | pm+pt | NA | NA | Perm |
| Protected Phases | 4 | | 1 | 6 | 2 | |
| Permitted Phases | | 4 | 6 | | | 2 |
| Detector Phase | 4 | 4 | 1 | 6 | 2 | 2 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| Minimum Split (s) | 22.0 | 22.0 | 15.0 | 22.0 | 22.0 | 22.0 |
| Total Split (s) | 36.0 | 36.0 | 15.0 | 114.0 | 99.0 | 99.0 |
| Total Split (%) | 24.0% | 24.0% | 10.0% | 76.0% | 66.0% | 66.0% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | | | Lead | | Lag | Lag |
| Lead-Lag Optimize? | | | | | | |
| Recall Mode | None | None | None | C-Max | C-Max | C-Max |
| Act Effct Green (s) | 30.0 | 30.0 | 108.0 | 108.0 | 96.8 | 96.8 |
| Actuated g/C Ratio | 0.20 | 0.20 | 0.72 | 0.72 | 0.65 | 0.65 |
| v/c Ratio | 1.06 | 0.84 | 0.52 | 0.16 | 1.01 | 0.41 |
| Control Delay | 121.3 | 17.4 | 45.3 | 0.1 | 49.9 | 2.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 121.3 | 17.4 | 45.3 | 0.1 | 49.9 | 2.9 |
| LOS | F | B | D | A | D | A |
| Approach Delay | 55.1 | | | 6.8 | 41.8 | |
| Approach LOS | E | | | A | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 150 | |
| Actuated Cycle Length: 150 | |
| Offset: 111 (74%), Referenced to phase 2:SBT and 6:NBTL, Start of Yellow | |
| Natural Cycle: 150 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.06 | |
| Intersection Signal Delay: 41.4 | Intersection LOS: D |
| Intersection Capacity Utilization 107.8% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 103: SC 27/Ridgeville Road & I-26 WB On-Ramp/I-26 WB Off-Ramp



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 312 | 4 | 555 | 55 | 317 | 0 | 0 | 1765 | 368 |
| Future Volume (veh/h) | 0 | 0 | 0 | 312 | 4 | 555 | 55 | 317 | 0 | 0 | 1765 | 368 |
| 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 | 1647 | 1583 | 1583 | 1583 | 0 | 0 | 1583 | 1583 |
| Adj Flow Rate, veh/h | | | | 347 | 4 | 617 | 61 | 352 | 0 | 0 | 1961 | 409 |
| Adj No. of Lanes | | | | 0 | 1 | 1 | 1 | 2 | 0 | 0 | 2 | 1 |
| Peak Hour Factor | | | | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | | | | 20 | 20 | 20 | 20 | 20 | 0 | 0 | 20 | 20 |
| Cap, veh/h | | | | 310 | 4 | 269 | 86 | 2166 | 0 | 0 | 1971 | 882 |
| Arrive On Green | | | | 0.20 | 0.20 | 0.20 | 0.05 | 1.00 | 0.00 | 0.00 | 0.66 | 0.66 |
| Sat Flow, veh/h | | | | 1551 | 18 | 1346 | 1508 | 3088 | 0 | 0 | 3088 | 1346 |
| Grp Volume(v), veh/h | | | | 351 | 0 | 617 | 61 | 352 | 0 | 0 | 1961 | 409 |
| Grp Sat Flow(s),veh/h/ln | | | | 1569 | 0 | 1346 | 1508 | 1504 | 0 | 0 | 1504 | 1346 |
| Q Serve(g_s), s | | | | 30.0 | 0.0 | 30.0 | 2.0 | 0.0 | 0.0 | 0.0 | 96.8 | 22.6 |
| Cycle Q Clear(g_c), s | | | | 30.0 | 0.0 | 30.0 | 2.0 | 0.0 | 0.0 | 0.0 | 96.8 | 22.6 |
| Prop In Lane | | | | 0.99 | | 1.00 | 1.00 | | 0.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | | | | 314 | 0 | 269 | 86 | 2166 | 0 | 0 | 1971 | 882 |
| V/C Ratio(X) | | | | 1.12 | 0.00 | 2.29 | 0.71 | 0.16 | 0.00 | 0.00 | 0.99 | 0.46 |
| Avail Cap(c_a), veh/h | | | | 314 | 0 | 269 | 140 | 2166 | 0 | 0 | 1971 | 882 |
| HCM Platoon Ratio | | | | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | | | | 1.00 | 0.00 | 1.00 | 0.36 | 0.36 | 0.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | | | | 60.0 | 0.0 | 60.0 | 39.8 | 0.0 | 0.0 | 0.0 | 25.6 | 12.8 |
| Incr Delay (d2), s/veh | | | | 86.6 | 0.0 | 593.1 | 3.8 | 0.1 | 0.0 | 0.0 | 19.1 | 1.8 |
| 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 | | | | 20.5 | 0.0 | 55.5 | 1.7 | 0.0 | 0.0 | 0.0 | 45.0 | 8.7 |
| LnGrp Delay(d),s/veh | | | | 146.6 | 0.0 | 653.1 | 43.7 | 0.1 | 0.0 | 0.0 | 44.6 | 14.6 |
| LnGrp LOS | | | | F | | F | D | A | | | D | B |
| Approach Vol, veh/h | | | | | 968 | | | 413 | | | 2370 | |
| Approach Delay, s/veh | | | | | 469.5 | | | 6.5 | | | 39.5 | |
| Approach LOS | | | | | F | | | A | | | D | |

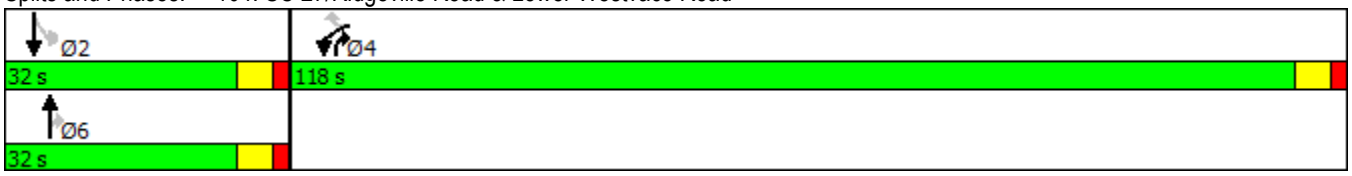
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | 1 | 2 | | 4 | | 6 | | |
| Phs Duration (G+Y+Rc), s | 9.7 | 104.3 | | 36.0 | | 114.0 | | |
| Change Period (Y+Rc), s | 6.0 | 6.0 | | 6.0 | | 6.0 | | |
| Max Green Setting (Gmax), s | 9.0 | 93.0 | | 30.0 | | 108.0 | | |
| Max Q Clear Time (g_c+I1), s | 4.0 | 98.8 | | 32.0 | | 2.0 | | |
| Green Ext Time (p_c), s | 0.0 | 0.0 | | 0.0 | | 103.6 | | |

| Intersection Summary | | |
|---|---|---|
| HCM 2010 Ctrl Delay | | 146.8 |
| HCM 2010 LOS | | F |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 1894 | 10 | 421 | 451 | 10 | 239 |
| Future Volume (vph) | 1894 | 10 | 421 | 451 | 10 | 239 |
| Turn Type | Prot | Perm | NA | pm+ov | Perm | NA |
| Protected Phases | 4 | | 6 | 4 | | 2 |
| Permitted Phases | | 4 | | 6 | 2 | |
| Detector Phase | 4 | 4 | 6 | 4 | 2 | 2 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| Minimum Split (s) | 22.0 | 22.0 | 22.0 | 22.0 | 22.0 | 22.0 |
| Total Split (s) | 118.0 | 118.0 | 32.0 | 118.0 | 32.0 | 32.0 |
| Total Split (%) | 78.7% | 78.7% | 21.3% | 78.7% | 21.3% | 21.3% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Recall Mode | None | None | Max | None | Max | Max |
| Act Effct Green (s) | 108.6 | 108.6 | 26.0 | 146.7 | 26.0 | 26.0 |
| Actuated g/C Ratio | 0.74 | 0.74 | 0.18 | 1.00 | 0.18 | 0.18 |
| v/c Ratio | 0.97 | 0.01 | 0.88 | 0.37 | 0.16 | 0.50 |
| Control Delay | 32.2 | 3.6 | 77.4 | 0.8 | 60.0 | 58.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 32.2 | 3.6 | 77.4 | 0.8 | 60.0 | 58.9 |
| LOS | C | A | E | A | E | E |
| Approach Delay | 32.1 | | 37.8 | | | 59.0 |
| Approach LOS | C | | D | | | E |

| Intersection Summary | |
|---|---|
| Cycle Length: 150 | |
| Actuated Cycle Length: 146.7 | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.97 | |
| Intersection Signal Delay: 35.9 | Intersection LOS: D |
| Intersection Capacity Utilization 75.7% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 104: SC 27/Ridgeville Road & Lower Westvaco Road



| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 1894 | 10 | 421 | 451 | 10 | 239 |
| Future Volume (veh/h) | 1894 | 10 | 421 | 451 | 10 | 239 |
| Number | 7 | 14 | 6 | 16 | 5 | 2 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1583 | 1583 | 1583 | 1583 | 1583 | 1583 |
| Adj Flow Rate, veh/h | 2104 | 11 | 468 | 501 | 11 | 266 |
| Adj No. of Lanes | 2 | 1 | 2 | 1 | 1 | 2 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | 20 | 20 | 20 | 20 | 20 | 20 |
| Cap, veh/h | 2165 | 996 | 535 | 1235 | 62 | 535 |
| Arrive On Green | 0.74 | 0.74 | 0.18 | 0.18 | 0.18 | 0.18 |
| Sat Flow, veh/h | 2925 | 1346 | 3088 | 1346 | 491 | 3088 |
| Grp Volume(v), veh/h | 2104 | 11 | 468 | 501 | 11 | 266 |
| Grp Sat Flow(s),veh/h/ln | 1463 | 1346 | 1504 | 1346 | 491 | 1504 |
| Q Serve(g_s), s | 97.3 | 0.3 | 22.2 | 7.1 | 3.3 | 11.7 |
| Cycle Q Clear(g_c), s | 97.3 | 0.3 | 22.2 | 7.1 | 25.4 | 11.7 |
| Prop In Lane | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Lane Grp Cap(c), veh/h | 2165 | 996 | 535 | 1235 | 62 | 535 |
| V/C Ratio(X) | 0.97 | 0.01 | 0.88 | 0.41 | 0.18 | 0.50 |
| Avail Cap(c_a), veh/h | 2240 | 1031 | 535 | 1235 | 62 | 535 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 17.6 | 5.0 | 58.5 | 0.8 | 70.9 | 54.2 |
| Incr Delay (d2), s/veh | 12.9 | 0.0 | 17.9 | 1.0 | 6.1 | 3.3 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 42.4 | 0.1 | 10.6 | 20.5 | 0.5 | 5.1 |
| LnGrp Delay(d),s/veh | 30.4 | 5.0 | 76.4 | 1.8 | 77.0 | 57.5 |
| LnGrp LOS | C | A | E | A | E | E |
| Approach Vol, veh/h | 2115 | | 969 | | | 277 |
| Approach Delay, s/veh | 30.3 | | 37.8 | | | 58.3 |
| Approach LOS | C | | D | | | E |

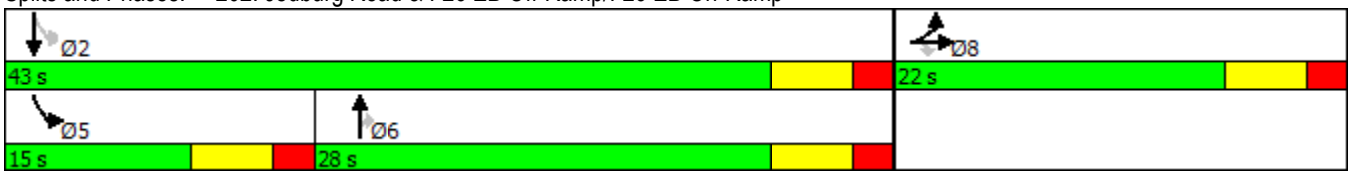
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | | 6 | | |
| Phs Duration (G+Y+Rc), s | | 32.0 | | 114.3 | | 32.0 | | |
| Change Period (Y+Rc), s | | 6.0 | | 6.0 | | 6.0 | | |
| Max Green Setting (Gmax), s | | 26.0 | | 112.0 | | 26.0 | | |
| Max Q Clear Time (g_c+I1), s | | 27.4 | | 99.3 | | 24.2 | | |
| Green Ext Time (p_c), s | | 0.0 | | 8.9 | | 1.6 | | |

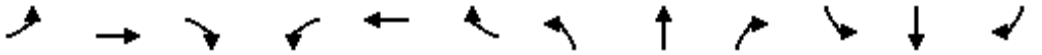
| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 34.8 |
| HCM 2010 LOS | C |

| Lane Group | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 0 | 173 | 821 | 443 | 232 | 1004 |
| Future Volume (vph) | 0 | 173 | 821 | 443 | 232 | 1004 |
| Turn Type | NA | Perm | NA | Perm | pm+pt | NA |
| Protected Phases | 8 | | 6 | | 5 | 2 |
| Permitted Phases | | 8 | | 6 | 2 | |
| Detector Phase | 8 | 8 | 6 | 6 | 5 | 2 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| Minimum Split (s) | 22.0 | 22.0 | 22.0 | 22.0 | 15.0 | 22.0 |
| Total Split (s) | 22.0 | 22.0 | 28.0 | 28.0 | 15.0 | 43.0 |
| Total Split (%) | 33.8% | 33.8% | 43.1% | 43.1% | 23.1% | 66.2% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | | | Lag | Lag | Lead | |
| Lead-Lag Optimize? | | | | | | |
| Recall Mode | None | None | Max | Max | None | Max |
| Act Effct Green (s) | 11.3 | 11.3 | 22.1 | 22.1 | 37.1 | 37.1 |
| Actuated g/C Ratio | 0.19 | 0.19 | 0.37 | 0.37 | 0.61 | 0.61 |
| v/c Ratio | 0.56 | 0.51 | 0.83 | 0.67 | 0.76 | 0.60 |
| Control Delay | 30.1 | 11.9 | 26.8 | 9.9 | 27.4 | 9.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 30.1 | 11.9 | 26.8 | 9.9 | 27.4 | 9.5 |
| LOS | C | B | C | A | C | A |
| Approach Delay | 20.0 | | 20.9 | | | 12.9 |
| Approach LOS | C | | C | | | B |

| Intersection Summary | |
|---|---|
| Cycle Length: 65 | |
| Actuated Cycle Length: 60.4 | |
| Natural Cycle: 65 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.83 | |
| Intersection Signal Delay: 17.3 | Intersection LOS: B |
| Intersection Capacity Utilization 63.0% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 202: Jedburg Road & I-26 EB Off-Ramp/I-26 EB On-Ramp





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 140 | 0 | 173 | 0 | 0 | 0 | 0 | 821 | 443 | 232 | 1004 | 0 |
| Future Volume (veh/h) | 140 | 0 | 173 | 0 | 0 | 0 | 0 | 821 | 443 | 232 | 1004 | 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 | 1583 | 1583 | | | | 0 | 1583 | 1583 | 1583 | 1583 | 0 |
| Adj Flow Rate, veh/h | 156 | 0 | 0 | | | | 0 | 912 | 0 | 258 | 1116 | 0 |
| Adj No. of Lanes | 0 | 1 | 1 | | | | 0 | 2 | 1 | 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, % | 20 | 20 | 20 | | | | 0 | 20 | 20 | 20 | 20 | 0 |
| Cap, veh/h | 194 | 0 | 173 | | | | 0 | 1292 | 578 | 406 | 1979 | 0 |
| Arrive On Green | 0.13 | 0.00 | 0.00 | | | | 0.00 | 0.43 | 0.00 | 0.12 | 0.66 | 0.00 |
| Sat Flow, veh/h | 1508 | 0 | 1346 | | | | 0 | 3088 | 1346 | 1508 | 3088 | 0 |
| Grp Volume(v), veh/h | 156 | 0 | 0 | | | | 0 | 912 | 0 | 258 | 1116 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1508 | 0 | 1346 | | | | 0 | 1504 | 1346 | 1508 | 1504 | 0 |
| Q Serve(g_s), s | 5.7 | 0.0 | 0.0 | | | | 0.0 | 14.0 | 0.0 | 4.8 | 11.3 | 0.0 |
| Cycle Q Clear(g_c), s | 5.7 | 0.0 | 0.0 | | | | 0.0 | 14.0 | 0.0 | 4.8 | 11.3 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | | | | 0.00 | | 1.00 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 194 | 0 | 173 | | | | 0 | 1292 | 578 | 406 | 1979 | 0 |
| V/C Ratio(X) | 0.80 | 0.00 | 0.00 | | | | 0.00 | 0.71 | 0.00 | 0.64 | 0.56 | 0.00 |
| Avail Cap(c_a), veh/h | 429 | 0 | 383 | | | | 0 | 1292 | 578 | 463 | 1979 | 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 | 23.8 | 0.0 | 0.0 | | | | 0.0 | 13.1 | 0.0 | 10.0 | 5.2 | 0.0 |
| Incr Delay (d2), s/veh | 7.6 | 0.0 | 0.0 | | | | 0.0 | 3.3 | 0.0 | 2.3 | 1.2 | 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 | 2.7 | 0.0 | 0.0 | | | | 0.0 | 6.3 | 0.0 | 2.1 | 5.0 | 0.0 |
| LnGrp Delay(d),s/veh | 31.4 | 0.0 | 0.0 | | | | 0.0 | 16.4 | 0.0 | 12.4 | 6.4 | 0.0 |
| LnGrp LOS | C | | | | | | | B | | B | A | |
| Approach Vol, veh/h | | 156 | | | | | | 912 | | | 1374 | |
| Approach Delay, s/veh | | 31.4 | | | | | | 16.4 | | | 7.5 | |
| Approach LOS | | C | | | | | | B | | | A | |

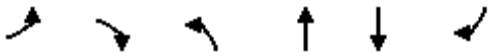
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | | 5 | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | 43.0 | | | 12.9 | 30.1 | | 13.2 |
| Change Period (Y+Rc), s | | 6.0 | | | 6.0 | 6.0 | | 6.0 |
| Max Green Setting (Gmax), s | | 37.0 | | | 9.0 | 22.0 | | 16.0 |
| Max Q Clear Time (g_c+I1), s | | 13.3 | | | 6.8 | 16.0 | | 7.7 |
| Green Ext Time (p_c), s | | 23.1 | | | 0.2 | 6.0 | | 0.3 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 12.4 |
| HCM 2010 LOS | B |

| Lane Group | NBL | NBT | SBT |
|---|---|---|---|
| Lane Configurations | | | |
| Traffic Volume (vph) | 243 | 718 | 610 |
| Future Volume (vph) | 243 | 718 | 610 |
| Turn Type | D.P+P | NA | NA |
| Protected Phases | 1 | Free | 2 |
| Permitted Phases | 2 | | |
| Detector Phase | 1 | | 2 |
| Switch Phase | | | |
| Minimum Initial (s) | 4.0 | | 4.0 |
| Minimum Split (s) | 15.0 | | 22.0 |
| Total Split (s) | 22.0 | | 38.0 |
| Total Split (%) | 36.7% | | 63.3% |
| Yellow Time (s) | 4.0 | | 4.0 |
| All-Red Time (s) | 2.0 | | 2.0 |
| Lost Time Adjust (s) | 0.0 | | 0.0 |
| Total Lost Time (s) | 6.0 | | 6.0 |
| Lead/Lag | Lead | | Lag |
| Lead-Lag Optimize? | | | |
| Recall Mode | None | | Max |
| Act Effct Green (s) | 39.4 | 51.4 | 32.0 |
| Actuated g/C Ratio | 0.77 | 1.00 | 0.62 |
| v/c Ratio | 0.51 | 0.27 | 0.48 |
| Control Delay | 5.5 | 0.2 | 5.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 |
| Total Delay | 5.5 | 0.2 | 5.8 |
| LOS | A | A | A |
| Approach Delay | | 1.6 | 5.8 |
| Approach LOS | | A | A |

| Intersection Summary | |
|---|---|
| Cycle Length: 60 | |
| Actuated Cycle Length: 51.4 | |
| Natural Cycle: 40 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.51 | |
| Intersection Signal Delay: 3.5 | Intersection LOS: A |
| Intersection Capacity Utilization 62.3% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 203: Jedburg Road & I-26 WB On-Ramp



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 0 | 0 | 243 | 718 | 610 | 184 |
| Future Volume (vph) | 0 | 0 | 243 | 718 | 610 | 184 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | | 6.0 | 4.0 | 6.0 | |
| Lane Util. Factor | | | 1.00 | 0.95 | 0.95 | |
| Frt | | | 1.00 | 1.00 | 0.97 | |
| Flt Protected | | | 0.95 | 1.00 | 1.00 | |
| Satd. Flow (prot) | | | 1504 | 3008 | 2904 | |
| Flt Permitted | | | 0.31 | 1.00 | 1.00 | |
| Satd. Flow (perm) | | | 498 | 3008 | 2904 | |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 0 | 0 | 270 | 798 | 678 | 204 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 38 | 0 |
| Lane Group Flow (vph) | 0 | 0 | 270 | 798 | 844 | 0 |
| Turn Type | | | D.P+P | NA | NA | |
| Protected Phases | | | 1 | Free | 2 | |
| Permitted Phases | | | 2 | | | |
| Actuated Green, G (s) | | | 39.4 | 51.4 | 32.0 | |
| Effective Green, g (s) | | | 39.4 | 51.4 | 32.0 | |
| Actuated g/C Ratio | | | 0.77 | 1.00 | 0.62 | |
| Clearance Time (s) | | | 6.0 | | 6.0 | |
| Vehicle Extension (s) | | | 3.0 | | 3.0 | |
| Lane Grp Cap (vph) | | | 526 | 3008 | 1807 | |
| v/s Ratio Prot | | | c0.07 | 0.27 | 0.29 | |
| v/s Ratio Perm | | | c0.32 | | | |
| v/c Ratio | | | 0.51 | 0.27 | 0.47 | |
| Uniform Delay, d1 | | | 1.7 | 0.0 | 5.2 | |
| Progression Factor | | | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | | | 0.8 | 0.2 | 0.9 | |
| Delay (s) | | | 2.6 | 0.2 | 6.0 | |
| Level of Service | | | A | A | A | |
| Approach Delay (s) | 0.0 | | | 0.8 | 6.0 | |
| Approach LOS | A | | | A | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 3.2 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.51 | | |
| Actuated Cycle Length (s) | 51.4 | Sum of lost time (s) | 12.0 |
| Intersection Capacity Utilization | 62.3% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

HCM 2010 analysis expects strict NEMA phasing.

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 120 | 10 | 10 | 1080 | 10 | 10 |
| Future Volume (vph) | 120 | 10 | 10 | 1080 | 10 | 10 |
| Turn Type | Prot | Perm | NA | Free | Perm | NA |
| Protected Phases | 6 | | 8 | | | 4 |
| Permitted Phases | | 6 | | Free | 4 | |
| Detector Phase | 6 | 6 | 8 | | 4 | 4 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 |
| Minimum Split (s) | 15.0 | 15.0 | 22.0 | | 22.0 | 22.0 |
| Total Split (s) | 34.0 | 34.0 | 26.0 | | 26.0 | 26.0 |
| Total Split (%) | 56.7% | 56.7% | 43.3% | | 43.3% | 43.3% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | | 6.0 | 6.0 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Recall Mode | Min | Min | None | | None | None |
| Act Effct Green (s) | 25.7 | 25.7 | 5.8 | 28.7 | 5.9 | 5.9 |
| Actuated g/C Ratio | 0.90 | 0.90 | 0.20 | 1.00 | 0.21 | 0.21 |
| v/c Ratio | 0.08 | 0.01 | 0.03 | 0.76 | 0.03 | 0.03 |
| Control Delay | 2.4 | 2.2 | 10.8 | 3.8 | 10.8 | 10.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 2.4 | 2.2 | 10.8 | 3.8 | 10.8 | 10.8 |
| LOS | A | A | B | A | B | B |
| Approach Delay | 2.4 | | 3.9 | | | 10.8 |
| Approach LOS | A | | A | | | B |

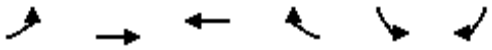
| Intersection Summary | |
|---|---|
| Cycle Length: 60 | |
| Actuated Cycle Length: 28.7 | |
| Natural Cycle: 40 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.76 | |
| Intersection Signal Delay: 3.8 | Intersection LOS: A |
| Intersection Capacity Utilization 23.9% | ICU Level of Service A |
| Analysis Period (min) 15 | |

Splits and Phases: 301: Factory Entrance/Welcome Center & Volvo Car Drive

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 120 | 10 | 10 | 1080 | 10 | 10 |
| Future Volume (veh/h) | 120 | 10 | 10 | 1080 | 10 | 10 |
| Number | 1 | 16 | 8 | 18 | 7 | 4 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1863 | 1863 | 1863 | 1863 | 1863 | 1863 |
| Adj Flow Rate, veh/h | 133 | 11 | 11 | 0 | 11 | 11 |
| Adj No. of Lanes | 1 | 1 | 1 | 1 | 1 | 1 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 428 | 382 | 63 | 54 | 474 | 63 |
| Arrive On Green | 0.24 | 0.24 | 0.03 | 0.00 | 0.03 | 0.03 |
| Sat Flow, veh/h | 1774 | 1583 | 1863 | 1583 | 1398 | 1863 |
| Grp Volume(v), veh/h | 133 | 11 | 11 | 0 | 11 | 11 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 1583 | 1863 | 1583 | 1398 | 1863 |
| Q Serve(g_s), s | 1.0 | 0.1 | 0.1 | 0.0 | 0.1 | 0.1 |
| Cycle Q Clear(g_c), s | 1.0 | 0.1 | 0.1 | 0.0 | 0.2 | 0.1 |
| Prop In Lane | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Lane Grp Cap(c), veh/h | 428 | 382 | 63 | 54 | 474 | 63 |
| V/C Ratio(X) | 0.31 | 0.03 | 0.17 | 0.00 | 0.02 | 0.17 |
| Avail Cap(c_a), veh/h | 2999 | 2677 | 2249 | 1912 | 2114 | 2249 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 5.2 | 4.8 | 7.8 | 0.0 | 7.9 | 7.8 |
| Incr Delay (d2), s/veh | 0.4 | 0.0 | 1.3 | 0.0 | 0.0 | 1.3 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(95%),veh/ln | 1.0 | 0.1 | 0.1 | 0.0 | 0.1 | 0.1 |
| LnGrp Delay(d),s/veh | 5.6 | 4.8 | 9.1 | 0.0 | 7.9 | 9.1 |
| LnGrp LOS | A | A | A | | A | A |
| Approach Vol, veh/h | 144 | | 11 | | | 22 |
| Approach Delay, s/veh | 5.5 | | 9.1 | | | 8.5 |
| Approach LOS | A | | A | | | A |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | | | 4 | | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | | | 6.6 | | 10.0 | | 6.6 |
| Change Period (Y+Rc), s | | | | 6.0 | | 6.0 | | 6.0 |
| Max Green Setting (Gmax), s | | | | 20.0 | | 28.0 | | 20.0 |
| Max Q Clear Time (g_c+I1), s | | | | 2.2 | | 3.0 | | 2.1 |
| Green Ext Time (p_c), s | | | | 0.0 | | 0.4 | | 0.0 |

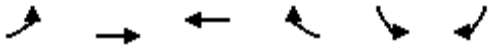
| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 6.1 |
| HCM 2010 LOS | A |



| Lane Group | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 166 | 206 | 336 | 241 | 338 | 314 |
| Future Volume (vph) | 166 | 206 | 336 | 241 | 338 | 314 |
| Turn Type | pm+pt | NA | NA | pm+ov | Prot | pm+ov |
| Protected Phases | 5 | 2 | 6 | 4 | 4 | 5 |
| Permitted Phases | 2 | | | 6 | | 4 |
| Detector Phase | 5 | 2 | 6 | 4 | 4 | 5 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| Minimum Split (s) | 15.0 | 22.0 | 22.0 | 22.0 | 22.0 | 15.0 |
| Total Split (s) | 15.0 | 38.0 | 23.0 | 22.0 | 22.0 | 15.0 |
| Total Split (%) | 25.0% | 63.3% | 38.3% | 36.7% | 36.7% | 25.0% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | | Lag | | | Lead |
| Lead-Lag Optimize? | | | | | | |
| Recall Mode | None | Max | Max | None | None | None |
| Act Effct Green (s) | 32.0 | 32.0 | 17.7 | 39.7 | 16.0 | 30.3 |
| Actuated g/C Ratio | 0.53 | 0.53 | 0.30 | 0.66 | 0.27 | 0.50 |
| v/c Ratio | 0.47 | 0.27 | 0.80 | 0.27 | 0.94 | 0.45 |
| Control Delay | 11.9 | 8.7 | 36.0 | 1.4 | 57.4 | 6.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 11.9 | 8.7 | 36.0 | 1.4 | 57.4 | 6.1 |
| LOS | B | A | D | A | E | A |
| Approach Delay | | 10.1 | 21.5 | | 32.7 | |
| Approach LOS | | B | C | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 60 | |
| Actuated Cycle Length: 60 | |
| Natural Cycle: 60 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.94 | |
| Intersection Signal Delay: 23.4 | Intersection LOS: C |
| Intersection Capacity Utilization 60.6% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 101: US 78 & SC 27/Ridgeville Road



| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 166 | 206 | 336 | 241 | 338 | 314 |
| Future Volume (veh/h) | 166 | 206 | 336 | 241 | 338 | 314 |
| Number | 5 | 2 | 6 | 16 | 7 | 14 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | | 1.00 | 1.00 | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1583 | 1583 | 1583 | 1583 | 1583 | 1583 |
| Adj Flow Rate, veh/h | 184 | 229 | 373 | 268 | 376 | 349 |
| Adj No. of Lanes | 1 | 1 | 1 | 1 | 1 | 1 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | 20 | 20 | 20 | 20 | 20 | 20 |
| Cap, veh/h | 359 | 844 | 521 | 802 | 402 | 499 |
| Arrive On Green | 0.10 | 0.53 | 0.33 | 0.33 | 0.27 | 0.27 |
| Sat Flow, veh/h | 1508 | 1583 | 1583 | 1346 | 1508 | 1346 |
| Grp Volume(v), veh/h | 184 | 229 | 373 | 268 | 376 | 349 |
| Grp Sat Flow(s),veh/h/ln | 1508 | 1583 | 1583 | 1346 | 1508 | 1346 |
| Q Serve(g_s), s | 4.4 | 4.7 | 12.4 | 6.0 | 14.6 | 13.2 |
| Cycle Q Clear(g_c), s | 4.4 | 4.7 | 12.4 | 6.0 | 14.6 | 13.2 |
| Prop In Lane | 1.00 | | | 1.00 | 1.00 | 1.00 |
| Lane Grp Cap(c), veh/h | 359 | 844 | 521 | 802 | 402 | 499 |
| V/C Ratio(X) | 0.51 | 0.27 | 0.72 | 0.33 | 0.94 | 0.70 |
| Avail Cap(c_a), veh/h | 428 | 844 | 521 | 802 | 402 | 499 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 12.1 | 7.6 | 17.7 | 6.1 | 21.5 | 16.0 |
| Incr Delay (d2), s/veh | 1.1 | 0.8 | 8.2 | 1.1 | 29.0 | 4.3 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(95%),veh/ln | 3.5 | 4.0 | 10.8 | 7.2 | 14.3 | 15.2 |
| LnGrp Delay(d),s/veh | 13.2 | 8.4 | 25.9 | 7.2 | 50.5 | 20.3 |
| LnGrp LOS | B | A | C | A | D | C |
| Approach Vol, veh/h | | 413 | 641 | | 725 | |
| Approach Delay, s/veh | | 10.6 | 18.1 | | 36.0 | |
| Approach LOS | | B | B | | D | |

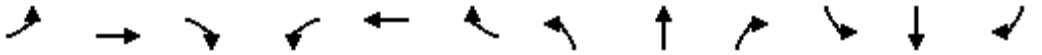
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | 5 | 6 | | |
| Phs Duration (G+Y+Rc), s | | 38.0 | | 22.0 | 12.3 | 25.7 | | |
| Change Period (Y+Rc), s | | 6.0 | | 6.0 | 6.0 | 6.0 | | |
| Max Green Setting (Gmax), s | | 32.0 | | 16.0 | 9.0 | 17.0 | | |
| Max Q Clear Time (g_c+I1), s | | 6.7 | | 16.6 | 6.4 | 14.4 | | |
| Green Ext Time (p_c), s | | 11.4 | | 0.0 | 0.1 | 1.8 | | |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 23.6 |
| HCM 2010 LOS | C |

| Lane Group | EBT | EBR | NBT | SBL | SBT |
|---|---|---|---|---|---|
| Lane Configurations | | | | | |
| Traffic Volume (vph) | 7 | 87 | 252 | 216 | 565 |
| Future Volume (vph) | 7 | 87 | 252 | 216 | 565 |
| Turn Type | NA | Perm | NA | pm+pt | NA |
| Protected Phases | 8 | | 6 | 5 | 2 |
| Permitted Phases | | 8 | | 2 | |
| Detector Phase | 8 | 8 | 6 | 5 | 2 |
| Switch Phase | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| Minimum Split (s) | 22.0 | 22.0 | 22.0 | 15.0 | 22.0 |
| Total Split (s) | 22.0 | 22.0 | 41.0 | 17.0 | 58.0 |
| Total Split (%) | 27.5% | 27.5% | 51.3% | 21.3% | 72.5% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | | | Lag | Lead | |
| Lead-Lag Optimize? | | | | | |
| Recall Mode | None | None | C-Min | None | C-Min |
| Act Effct Green (s) | 9.5 | 9.5 | 45.3 | 60.9 | 62.1 |
| Actuated g/C Ratio | 0.12 | 0.12 | 0.57 | 0.76 | 0.78 |
| v/c Ratio | 0.44 | 0.36 | 0.52 | 0.42 | 0.51 |
| Control Delay | 39.1 | 8.0 | 14.7 | 6.7 | 7.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 39.1 | 8.0 | 14.7 | 6.7 | 7.3 |
| LOS | D | A | B | A | A |
| Approach Delay | 22.6 | | 14.7 | | 7.1 |
| Approach LOS | C | | B | | A |

| Intersection Summary | |
|---|---|
| Cycle Length: 80 | |
| Actuated Cycle Length: 80 | |
| Offset: 57 (71%), Referenced to phase 2:SBTL and 6:NBT, Start of Yellow | |
| Natural Cycle: 60 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.52 | |
| Intersection Signal Delay: 11.3 | Intersection LOS: B |
| Intersection Capacity Utilization 60.5% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 102: SC 27/Ridgeville Road & I-26 EB Off-Ramp/I-26 EB On-Ramp



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 70 | 7 | 87 | 0 | 0 | 0 | 0 | 252 | 155 | 216 | 565 | 0 |
| Future Volume (veh/h) | 70 | 7 | 87 | 0 | 0 | 0 | 0 | 252 | 155 | 216 | 565 | 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 | 1881 | 1630 | 1568 | | | | 0 | 1568 | 1881 | 1583 | 1583 | 0 |
| Adj Flow Rate, veh/h | 78 | 8 | 97 | | | | 0 | 280 | 172 | 240 | 628 | 0 |
| Adj No. of Lanes | 0 | 1 | 1 | | | | 0 | 1 | 0 | 1 | 1 | 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, % | 20 | 20 | 20 | | | | 0 | 20 | 20 | 20 | 20 | 0 |
| Cap, veh/h | 139 | 14 | 131 | | | | 0 | 533 | 327 | 546 | 1190 | 0 |
| Arrive On Green | 0.10 | 0.10 | 0.10 | | | | 0.00 | 0.59 | 0.59 | 0.18 | 1.00 | 0.00 |
| Sat Flow, veh/h | 1414 | 145 | 1332 | | | | 0 | 910 | 559 | 1508 | 1583 | 0 |
| Grp Volume(v), veh/h | 86 | 0 | 97 | | | | 0 | 0 | 452 | 240 | 628 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1559 | 0 | 1332 | | | | 0 | 0 | 1469 | 1508 | 1583 | 0 |
| Q Serve(g_s), s | 4.2 | 0.0 | 5.7 | | | | 0.0 | 0.0 | 14.7 | 5.0 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 4.2 | 0.0 | 5.7 | | | | 0.0 | 0.0 | 14.7 | 5.0 | 0.0 | 0.0 |
| Prop In Lane | 0.91 | | 1.00 | | | | 0.00 | | 0.38 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 154 | 0 | 131 | | | | 0 | 0 | 860 | 546 | 1190 | 0 |
| V/C Ratio(X) | 0.56 | 0.00 | 0.74 | | | | 0.00 | 0.00 | 0.53 | 0.44 | 0.53 | 0.00 |
| Avail Cap(c_a), veh/h | 312 | 0 | 266 | | | | 0 | 0 | 860 | 617 | 1190 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 0.00 | 1.00 | 0.79 | 0.79 | 0.00 |
| Uniform Delay (d), s/veh | 34.4 | 0.0 | 35.1 | | | | 0.0 | 0.0 | 9.9 | 6.0 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 3.2 | 0.0 | 7.9 | | | | 0.0 | 0.0 | 2.3 | 0.4 | 1.3 | 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(95%),veh/ln | 3.5 | 0.0 | 4.3 | | | | 0.0 | 0.0 | 10.6 | 3.7 | 0.8 | 0.0 |
| LnGrp Delay(d),s/veh | 37.6 | 0.0 | 42.9 | | | | 0.0 | 0.0 | 12.2 | 6.5 | 1.3 | 0.0 |
| LnGrp LOS | D | | D | | | | | | B | A | A | |
| Approach Vol, veh/h | | 183 | | | | | | 452 | | | 868 | |
| Approach Delay, s/veh | | 40.4 | | | | | | 12.2 | | | 2.8 | |
| Approach LOS | | D | | | | | | B | | | A | |

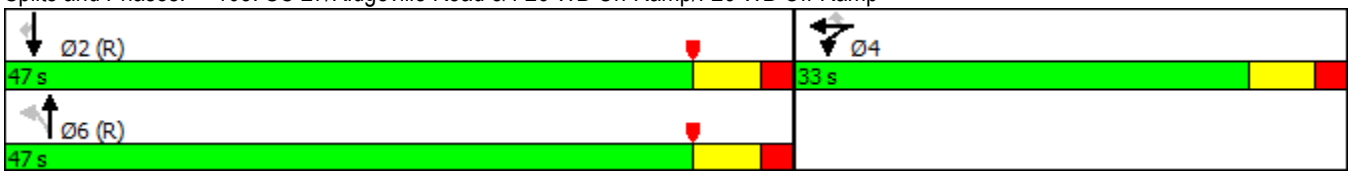
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | | 5 | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | 66.1 | | | 13.3 | 52.9 | | 13.9 |
| Change Period (Y+Rc), s | | 6.0 | | | 6.0 | 6.0 | | 6.0 |
| Max Green Setting (Gmax), s | | 52.0 | | | 11.0 | 35.0 | | 16.0 |
| Max Q Clear Time (g_c+I1), s | | 2.0 | | | 7.0 | 16.7 | | 7.7 |
| Green Ext Time (p_c), s | | 33.3 | | | 0.3 | 15.0 | | 0.4 |

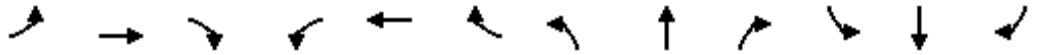
| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 10.2 |
| HCM 2010 LOS | B |

| Lane Group | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 4 | 295 | 55 | 267 | 469 | 96 |
| Future Volume (vph) | 4 | 295 | 55 | 267 | 469 | 96 |
| Turn Type | NA | Perm | Perm | NA | NA | Perm |
| Protected Phases | 4 | | | 6 | 2 | |
| Permitted Phases | | 4 | 6 | | | 2 |
| Detector Phase | 4 | 4 | 6 | 6 | 2 | 2 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| Minimum Split (s) | 22.0 | 22.0 | 22.0 | 22.0 | 22.0 | 22.0 |
| Total Split (s) | 33.0 | 33.0 | 47.0 | 47.0 | 47.0 | 47.0 |
| Total Split (%) | 41.3% | 41.3% | 58.8% | 58.8% | 58.8% | 58.8% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Recall Mode | None | None | C-Min | C-Min | C-Min | C-Min |
| Act Effct Green (s) | 22.0 | 22.0 | 46.0 | 46.0 | 46.0 | 46.0 |
| Actuated g/C Ratio | 0.28 | 0.28 | 0.58 | 0.58 | 0.58 | 0.58 |
| v/c Ratio | 0.78 | 0.54 | 0.17 | 0.33 | 0.58 | 0.13 |
| Control Delay | 38.7 | 6.2 | 4.4 | 4.9 | 15.3 | 2.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 38.7 | 6.2 | 4.4 | 4.9 | 15.3 | 2.7 |
| LOS | D | A | A | A | B | A |
| Approach Delay | 23.0 | | | 4.8 | 13.2 | |
| Approach LOS | C | | | A | B | |

| Intersection Summary | |
|---|---|
| Cycle Length: 80 | |
| Actuated Cycle Length: 80 | |
| Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBTL, Start of Yellow | |
| Natural Cycle: 60 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.78 | |
| Intersection Signal Delay: 15.4 | Intersection LOS: B |
| Intersection Capacity Utilization 60.5% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 103: SC 27/Ridgeville Road & I-26 WB On-Ramp/I-26 WB Off-Ramp





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 312 | 4 | 295 | 55 | 267 | 0 | 0 | 469 | 96 |
| Future Volume (veh/h) | 0 | 0 | 0 | 312 | 4 | 295 | 55 | 267 | 0 | 0 | 469 | 96 |
| 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 | | | | 1881 | 1630 | 1568 | 1583 | 1583 | 0 | 0 | 1568 | 1568 |
| Adj Flow Rate, veh/h | | | | 347 | 4 | 328 | 61 | 297 | 0 | 0 | 521 | 107 |
| Adj No. of Lanes | | | | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 |
| Peak Hour Factor | | | | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | | | | 20 | 20 | 20 | 20 | 20 | 0 | 0 | 20 | 20 |
| Cap, veh/h | | | | 429 | 5 | 372 | 331 | 903 | 0 | 0 | 894 | 760 |
| Arrive On Green | | | | 0.28 | 0.28 | 0.28 | 0.19 | 0.19 | 0.00 | 0.00 | 0.57 | 0.57 |
| Sat Flow, veh/h | | | | 1536 | 18 | 1332 | 675 | 1583 | 0 | 0 | 1568 | 1332 |
| Grp Volume(v), veh/h | | | | 351 | 0 | 328 | 61 | 297 | 0 | 0 | 521 | 107 |
| Grp Sat Flow(s),veh/h/ln | | | | 1553 | 0 | 1332 | 675 | 1583 | 0 | 0 | 1568 | 1332 |
| Q Serve(g_s), s | | | | 16.8 | 0.0 | 18.8 | 6.6 | 13.0 | 0.0 | 0.0 | 17.1 | 3.0 |
| Cycle Q Clear(g_c), s | | | | 16.8 | 0.0 | 18.8 | 23.7 | 13.0 | 0.0 | 0.0 | 17.1 | 3.0 |
| Prop In Lane | | | | 0.99 | | 1.00 | 1.00 | | 0.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | | | | 434 | 0 | 372 | 331 | 903 | 0 | 0 | 894 | 760 |
| V/C Ratio(X) | | | | 0.81 | 0.00 | 0.88 | 0.18 | 0.33 | 0.00 | 0.00 | 0.58 | 0.14 |
| Avail Cap(c_a), veh/h | | | | 524 | 0 | 450 | 331 | 903 | 0 | 0 | 894 | 760 |
| HCM Platoon Ratio | | | | 1.00 | 1.00 | 1.00 | 0.33 | 0.33 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | | | | 1.00 | 0.00 | 1.00 | 0.84 | 0.84 | 0.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | | | | 26.8 | 0.0 | 27.6 | 31.3 | 19.2 | 0.0 | 0.0 | 11.0 | 8.0 |
| Incr Delay (d2), s/veh | | | | 7.8 | 0.0 | 15.9 | 1.0 | 0.8 | 0.0 | 0.0 | 2.8 | 0.4 |
| 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(95%),veh/ln | | | | 12.8 | 0.0 | 13.4 | 2.4 | 9.6 | 0.0 | 0.0 | 12.7 | 2.1 |
| LnGrp Delay(d),s/veh | | | | 34.6 | 0.0 | 43.5 | 32.4 | 20.0 | 0.0 | 0.0 | 13.8 | 8.4 |
| LnGrp LOS | | | | C | | D | C | C | | | B | A |
| Approach Vol, veh/h | | | | | 679 | | | 358 | | | 628 | |
| Approach Delay, s/veh | | | | | 38.9 | | | 22.1 | | | 12.9 | |
| Approach LOS | | | | | D | | | C | | | B | |

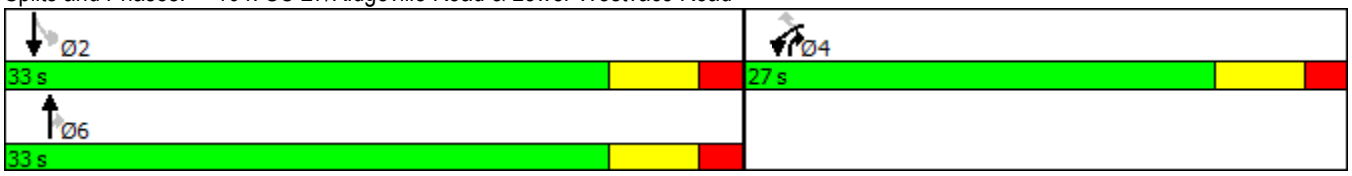
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | | 6 | | |
| Phs Duration (G+Y+Rc), s | | 51.7 | | 28.3 | | 51.7 | | |
| Change Period (Y+Rc), s | | 6.0 | | 6.0 | | 6.0 | | |
| Max Green Setting (Gmax), s | | 41.0 | | 27.0 | | 41.0 | | |
| Max Q Clear Time (g_c+I1), s | | 19.1 | | 20.8 | | 25.7 | | |
| Green Ext Time (p_c), s | | 14.8 | | 1.5 | | 11.2 | | |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 25.5 |
| HCM 2010 LOS | C |

| Lane Group | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 322 | 10 | 421 | 137 | 10 | 239 |
| Future Volume (vph) | 322 | 10 | 421 | 137 | 10 | 239 |
| Turn Type | Prot | Perm | NA | pm+ov | Perm | NA |
| Protected Phases | 4 | | 6 | 4 | | 2 |
| Permitted Phases | | 4 | | 6 | 2 | |
| Detector Phase | 4 | 4 | 6 | 4 | 2 | 2 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| Minimum Split (s) | 22.0 | 22.0 | 22.0 | 22.0 | 22.0 | 22.0 |
| Total Split (s) | 27.0 | 27.0 | 33.0 | 27.0 | 33.0 | 33.0 |
| Total Split (%) | 45.0% | 45.0% | 55.0% | 45.0% | 55.0% | 55.0% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | | 6.0 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Recall Mode | None | None | Max | None | Max | Max |
| Act Effct Green (s) | 17.2 | 17.2 | 27.1 | 56.4 | | 27.1 |
| Actuated g/C Ratio | 0.30 | 0.30 | 0.48 | 1.00 | | 0.48 |
| v/c Ratio | 0.78 | 0.03 | 0.61 | 0.11 | | 0.37 |
| Control Delay | 31.0 | 7.6 | 16.2 | 0.2 | | 12.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 |
| Total Delay | 31.0 | 7.6 | 16.2 | 0.2 | | 12.1 |
| LOS | C | A | B | A | | B |
| Approach Delay | 30.3 | | 12.2 | | | 12.1 |
| Approach LOS | C | | B | | | B |

| Intersection Summary | |
|---|---|
| Cycle Length: 60 | |
| Actuated Cycle Length: 56.4 | |
| Natural Cycle: 55 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.78 | |
| Intersection Signal Delay: 17.5 | Intersection LOS: B |
| Intersection Capacity Utilization 50.0% | ICU Level of Service A |
| Analysis Period (min) 15 | |

Splits and Phases: 104: SC 27/Ridgeville Road & Lower Westvaco Road



| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 322 | 10 | 421 | 137 | 10 | 239 |
| Future Volume (veh/h) | 322 | 10 | 421 | 137 | 10 | 239 |
| Number | 7 | 14 | 6 | 16 | 5 | 2 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | 1.00 | | 1.00 | 1.00 | |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1583 | 1583 | 1583 | 1583 | 1900 | 1583 |
| Adj Flow Rate, veh/h | 358 | 11 | 468 | 152 | 11 | 266 |
| Adj No. of Lanes | 1 | 1 | 1 | 1 | 0 | 1 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | 20 | 20 | 20 | 20 | 20 | 20 |
| Cap, veh/h | 416 | 371 | 794 | 1046 | 79 | 772 |
| Arrive On Green | 0.28 | 0.28 | 0.50 | 0.50 | 0.50 | 0.50 |
| Sat Flow, veh/h | 1508 | 1346 | 1583 | 1346 | 19 | 1539 |
| Grp Volume(v), veh/h | 358 | 11 | 468 | 152 | 277 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1508 | 1346 | 1583 | 1346 | 1558 | 0 |
| Q Serve(g_s), s | 12.1 | 0.3 | 11.3 | 1.5 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 12.1 | 0.3 | 11.3 | 1.5 | 5.7 | 0.0 |
| Prop In Lane | 1.00 | 1.00 | | 1.00 | 0.04 | |
| Lane Grp Cap(c), veh/h | 416 | 371 | 794 | 1046 | 851 | 0 |
| V/C Ratio(X) | 0.86 | 0.03 | 0.59 | 0.15 | 0.33 | 0.00 |
| Avail Cap(c_a), veh/h | 588 | 525 | 794 | 1046 | 851 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 18.5 | 14.2 | 9.5 | 1.5 | 8.1 | 0.0 |
| Incr Delay (d2), s/veh | 9.0 | 0.0 | 3.2 | 0.3 | 1.0 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(95%),veh/ln | 10.0 | 0.2 | 9.4 | 2.4 | 4.9 | 0.0 |
| LnGrp Delay(d),s/veh | 27.5 | 14.3 | 12.7 | 1.8 | 9.1 | 0.0 |
| LnGrp LOS | C | B | B | A | A | |
| Approach Vol, veh/h | 369 | | 620 | | | 277 |
| Approach Delay, s/veh | 27.2 | | 10.0 | | | 9.1 |
| Approach LOS | C | | B | | | A |

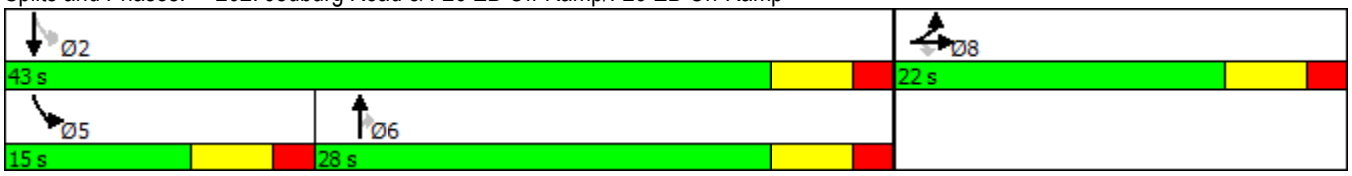
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | | 6 | | |
| Phs Duration (G+Y+Rc), s | | 33.0 | | 20.9 | | 33.0 | | |
| Change Period (Y+Rc), s | | 6.0 | | 6.0 | | 6.0 | | |
| Max Green Setting (Gmax), s | | 27.0 | | 21.0 | | 27.0 | | |
| Max Q Clear Time (g_c+I1), s | | 7.7 | | 14.1 | | 13.3 | | |
| Green Ext Time (p_c), s | | 11.8 | | 0.8 | | 9.1 | | |

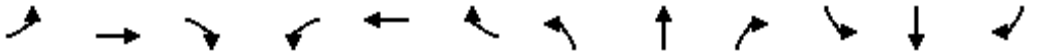
| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 14.8 |
| HCM 2010 LOS | B |

| Lane Group | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 0 | 173 | 821 | 443 | 232 | 1004 |
| Future Volume (vph) | 0 | 173 | 821 | 443 | 232 | 1004 |
| Turn Type | NA | Perm | NA | Perm | pm+pt | NA |
| Protected Phases | 8 | | 6 | | 5 | 2 |
| Permitted Phases | | 8 | | 6 | 2 | |
| Detector Phase | 8 | 8 | 6 | 6 | 5 | 2 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| Minimum Split (s) | 22.0 | 22.0 | 22.0 | 22.0 | 15.0 | 22.0 |
| Total Split (s) | 22.0 | 22.0 | 28.0 | 28.0 | 15.0 | 43.0 |
| Total Split (%) | 33.8% | 33.8% | 43.1% | 43.1% | 23.1% | 66.2% |
| Yellow Time (s) | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | | | Lag | Lag | Lead | |
| Lead-Lag Optimize? | | | | | | |
| Recall Mode | None | None | Max | Max | None | Max |
| Act Effct Green (s) | 11.3 | 11.3 | 22.1 | 22.1 | 37.1 | 37.1 |
| Actuated g/C Ratio | 0.19 | 0.19 | 0.37 | 0.37 | 0.61 | 0.61 |
| v/c Ratio | 0.56 | 0.51 | 0.83 | 0.67 | 0.76 | 0.60 |
| Control Delay | 30.1 | 11.9 | 26.8 | 9.9 | 27.4 | 9.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 30.1 | 11.9 | 26.8 | 9.9 | 27.4 | 9.5 |
| LOS | C | B | C | A | C | A |
| Approach Delay | 20.0 | | 20.9 | | | 12.9 |
| Approach LOS | C | | C | | | B |

| Intersection Summary | |
|---|---|
| Cycle Length: 65 | |
| Actuated Cycle Length: 60.4 | |
| Natural Cycle: 65 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.83 | |
| Intersection Signal Delay: 17.3 | Intersection LOS: B |
| Intersection Capacity Utilization 63.0% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 202: Jedburg Road & I-26 EB Off-Ramp/I-26 EB On-Ramp





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 140 | 0 | 173 | 0 | 0 | 0 | 0 | 821 | 443 | 232 | 1004 | 0 |
| Future Volume (veh/h) | 140 | 0 | 173 | 0 | 0 | 0 | 0 | 821 | 443 | 232 | 1004 | 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 | 1583 | 1583 | | | | 0 | 1583 | 1583 | 1583 | 1583 | 0 |
| Adj Flow Rate, veh/h | 156 | 0 | 0 | | | | 0 | 912 | 0 | 258 | 1116 | 0 |
| Adj No. of Lanes | 0 | 1 | 1 | | | | 0 | 2 | 1 | 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, % | 20 | 20 | 20 | | | | 0 | 20 | 20 | 20 | 20 | 0 |
| Cap, veh/h | 194 | 0 | 173 | | | | 0 | 1292 | 578 | 406 | 1979 | 0 |
| Arrive On Green | 0.13 | 0.00 | 0.00 | | | | 0.00 | 0.43 | 0.00 | 0.12 | 0.66 | 0.00 |
| Sat Flow, veh/h | 1508 | 0 | 1346 | | | | 0 | 3088 | 1346 | 1508 | 3088 | 0 |
| Grp Volume(v), veh/h | 156 | 0 | 0 | | | | 0 | 912 | 0 | 258 | 1116 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1508 | 0 | 1346 | | | | 0 | 1504 | 1346 | 1508 | 1504 | 0 |
| Q Serve(g_s), s | 5.7 | 0.0 | 0.0 | | | | 0.0 | 14.0 | 0.0 | 4.8 | 11.3 | 0.0 |
| Cycle Q Clear(g_c), s | 5.7 | 0.0 | 0.0 | | | | 0.0 | 14.0 | 0.0 | 4.8 | 11.3 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | | | | 0.00 | | 1.00 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 194 | 0 | 173 | | | | 0 | 1292 | 578 | 406 | 1979 | 0 |
| V/C Ratio(X) | 0.80 | 0.00 | 0.00 | | | | 0.00 | 0.71 | 0.00 | 0.64 | 0.56 | 0.00 |
| Avail Cap(c_a), veh/h | 429 | 0 | 383 | | | | 0 | 1292 | 578 | 463 | 1979 | 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 | 23.8 | 0.0 | 0.0 | | | | 0.0 | 13.1 | 0.0 | 10.0 | 5.2 | 0.0 |
| Incr Delay (d2), s/veh | 7.6 | 0.0 | 0.0 | | | | 0.0 | 3.3 | 0.0 | 2.3 | 1.2 | 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(95%),veh/ln | 4.9 | 0.0 | 0.0 | | | | 0.0 | 10.4 | 0.0 | 3.8 | 8.6 | 0.0 |
| LnGrp Delay(d),s/veh | 31.4 | 0.0 | 0.0 | | | | 0.0 | 16.4 | 0.0 | 12.4 | 6.4 | 0.0 |
| LnGrp LOS | C | | | | | | | B | | B | A | |
| Approach Vol, veh/h | | 156 | | | | | | 912 | | | 1374 | |
| Approach Delay, s/veh | | 31.4 | | | | | | 16.4 | | | 7.5 | |
| Approach LOS | | C | | | | | | B | | | A | |

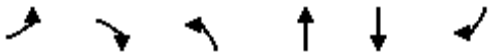
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | | 5 | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | 43.0 | | | 12.9 | 30.1 | | 13.2 |
| Change Period (Y+Rc), s | | 6.0 | | | 6.0 | 6.0 | | 6.0 |
| Max Green Setting (Gmax), s | | 37.0 | | | 9.0 | 22.0 | | 16.0 |
| Max Q Clear Time (g_c+I1), s | | 13.3 | | | 6.8 | 16.0 | | 7.7 |
| Green Ext Time (p_c), s | | 23.1 | | | 0.2 | 6.0 | | 0.3 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 12.4 |
| HCM 2010 LOS | B |

| Lane Group | NBL | NBT | SBT |
|---|---|---|---|
| Lane Configurations | | | |
| Traffic Volume (vph) | 243 | 718 | 610 |
| Future Volume (vph) | 243 | 718 | 610 |
| Turn Type | D.P+P | NA | NA |
| Protected Phases | 1 | Free | 2 |
| Permitted Phases | 2 | | |
| Detector Phase | 1 | | 2 |
| Switch Phase | | | |
| Minimum Initial (s) | 4.0 | | 4.0 |
| Minimum Split (s) | 15.0 | | 22.0 |
| Total Split (s) | 22.0 | | 38.0 |
| Total Split (%) | 36.7% | | 63.3% |
| Yellow Time (s) | 4.0 | | 4.0 |
| All-Red Time (s) | 2.0 | | 2.0 |
| Lost Time Adjust (s) | 0.0 | | 0.0 |
| Total Lost Time (s) | 6.0 | | 6.0 |
| Lead/Lag | Lead | | Lag |
| Lead-Lag Optimize? | | | |
| Recall Mode | None | | Max |
| Act Effct Green (s) | 39.4 | 51.4 | 32.0 |
| Actuated g/C Ratio | 0.77 | 1.00 | 0.62 |
| v/c Ratio | 0.51 | 0.27 | 0.48 |
| Control Delay | 5.5 | 0.2 | 5.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 |
| Total Delay | 5.5 | 0.2 | 5.8 |
| LOS | A | A | A |
| Approach Delay | | 1.6 | 5.8 |
| Approach LOS | | A | A |

| Intersection Summary | |
|---|---|
| Cycle Length: 60 | |
| Actuated Cycle Length: 51.4 | |
| Natural Cycle: 40 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.51 | |
| Intersection Signal Delay: 3.5 | Intersection LOS: A |
| Intersection Capacity Utilization 62.3% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 203: Jedburg Road & I-26 WB On-Ramp



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 0 | 0 | 243 | 718 | 610 | 184 |
| Future Volume (vph) | 0 | 0 | 243 | 718 | 610 | 184 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | | 6.0 | 4.0 | 6.0 | |
| Lane Util. Factor | | | 1.00 | 0.95 | 0.95 | |
| Frt | | | 1.00 | 1.00 | 0.97 | |
| Flt Protected | | | 0.95 | 1.00 | 1.00 | |
| Satd. Flow (prot) | | | 1504 | 3008 | 2904 | |
| Flt Permitted | | | 0.31 | 1.00 | 1.00 | |
| Satd. Flow (perm) | | | 498 | 3008 | 2904 | |
| Peak-hour factor, PHF | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Adj. Flow (vph) | 0 | 0 | 270 | 798 | 678 | 204 |
| RTOR Reduction (vph) | 0 | 0 | 0 | 0 | 38 | 0 |
| Lane Group Flow (vph) | 0 | 0 | 270 | 798 | 844 | 0 |
| Turn Type | | | D.P+P | NA | NA | |
| Protected Phases | | | 1 | Free | 2 | |
| Permitted Phases | | | 2 | | | |
| Actuated Green, G (s) | | | 39.4 | 51.4 | 32.0 | |
| Effective Green, g (s) | | | 39.4 | 51.4 | 32.0 | |
| Actuated g/C Ratio | | | 0.77 | 1.00 | 0.62 | |
| Clearance Time (s) | | | 6.0 | | 6.0 | |
| Vehicle Extension (s) | | | 3.0 | | 3.0 | |
| Lane Grp Cap (vph) | | | 526 | 3008 | 1807 | |
| v/s Ratio Prot | | | c0.07 | 0.27 | 0.29 | |
| v/s Ratio Perm | | | c0.32 | | | |
| v/c Ratio | | | 0.51 | 0.27 | 0.47 | |
| Uniform Delay, d1 | | | 1.7 | 0.0 | 5.2 | |
| Progression Factor | | | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | | | 0.8 | 0.2 | 0.9 | |
| Delay (s) | | | 2.6 | 0.2 | 6.0 | |
| Level of Service | | | A | A | A | |
| Approach Delay (s) | 0.0 | | | 0.8 | 6.0 | |
| Approach LOS | A | | | A | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 3.2 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.51 | | |
| Actuated Cycle Length (s) | 51.4 | Sum of lost time (s) | 12.0 |
| Intersection Capacity Utilization | 62.3% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

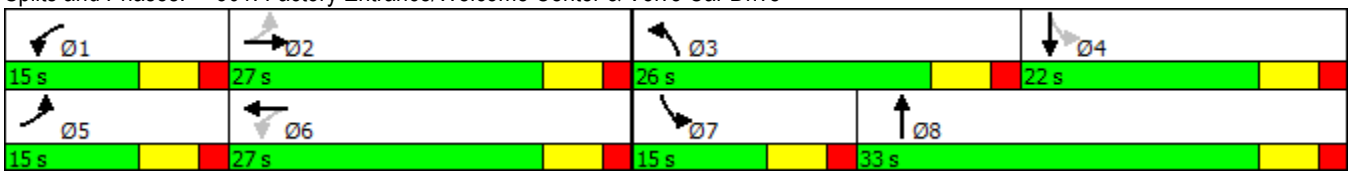
c Critical Lane Group

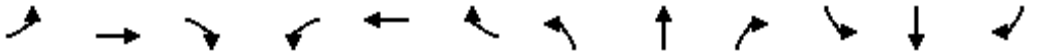
HCM 2010 analysis expects strict NEMA phasing.

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 10 | 227 | 83 | 37 | 823 | 745 | 10 | 10 | 10 |
| Future Volume (vph) | 10 | 227 | 83 | 37 | 823 | 745 | 10 | 10 | 10 |
| Turn Type | pm+pt | NA | Free | pm+pt | NA | Prot | NA | pm+pt | NA |
| Protected Phases | 5 | 2 | | 1 | 6 | 3 | 8 | 7 | 4 |
| Permitted Phases | 2 | | Free | 6 | | | | 4 | |
| Detector Phase | 5 | 2 | | 1 | 6 | 3 | 8 | 7 | 4 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| Minimum Split (s) | 15.0 | 22.0 | | 15.0 | 22.0 | 15.0 | 22.0 | 15.0 | 22.0 |
| Total Split (s) | 15.0 | 27.0 | | 15.0 | 27.0 | 26.0 | 33.0 | 15.0 | 22.0 |
| Total Split (%) | 16.7% | 30.0% | | 16.7% | 30.0% | 28.9% | 36.7% | 16.7% | 24.4% |
| Yellow Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | | | | | | | | | |
| Recall Mode | None | Min | | None | Min | None | None | None | None |
| Act Effct Green (s) | 21.1 | 18.8 | 58.5 | 23.0 | 21.8 | 20.5 | 20.7 | 7.1 | 6.2 |
| Actuated g/C Ratio | 0.36 | 0.32 | 1.00 | 0.39 | 0.37 | 0.35 | 0.35 | 0.12 | 0.11 |
| v/c Ratio | 0.04 | 0.26 | 0.06 | 0.08 | 0.72 | 0.69 | 0.48 | 0.05 | 0.11 |
| Control Delay | 12.2 | 18.7 | 0.1 | 12.0 | 22.5 | 22.6 | 5.1 | 18.9 | 21.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 12.2 | 18.7 | 0.1 | 12.0 | 22.5 | 22.6 | 5.1 | 18.9 | 21.6 |
| LOS | B | B | A | B | C | C | A | B | C |
| Approach Delay | | 13.7 | | | 22.1 | | 17.1 | | 20.7 |
| Approach LOS | | B | | | C | | B | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 58.5 | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.72 | |
| Intersection Signal Delay: 18.5 | Intersection LOS: B |
| Intersection Capacity Utilization 68.7% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 301: Factory Entrance/Welcome Center & Volvo Car Drive





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 10 | 227 | 83 | 37 | 823 | 10 | 745 | 10 | 335 | 10 | 10 | 10 |
| Future Volume (veh/h) | 10 | 227 | 83 | 37 | 823 | 10 | 745 | 10 | 335 | 10 | 10 | 10 |
| Number | 5 | 2 | 12 | 1 | 6 | 16 | 3 | 8 | 18 | 7 | 4 | 14 |
| 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 | 1863 | 1557 | 1863 | 1863 | 1810 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 11 | 252 | 0 | 41 | 914 | 11 | 828 | 11 | 372 | 11 | 11 | 11 |
| Adj No. of Lanes | 1 | 2 | 1 | 1 | 2 | 0 | 2 | 1 | 0 | 1 | 1 | 0 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | 2 | 22 | 2 | 2 | 5 | 5 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 159 | 840 | 450 | 405 | 1060 | 13 | 939 | 15 | 498 | 185 | 52 | 52 |
| Arrive On Green | 0.01 | 0.28 | 0.00 | 0.03 | 0.30 | 0.30 | 0.27 | 0.32 | 0.32 | 0.01 | 0.06 | 0.06 |
| Sat Flow, veh/h | 1774 | 2959 | 1583 | 1774 | 3480 | 42 | 3442 | 46 | 1545 | 1774 | 856 | 856 |
| Grp Volume(v), veh/h | 11 | 252 | 0 | 41 | 452 | 473 | 828 | 0 | 383 | 11 | 0 | 22 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 1480 | 1583 | 1774 | 1720 | 1803 | 1721 | 0 | 1590 | 1774 | 0 | 1712 |
| Q Serve(g_s), s | 0.3 | 4.6 | 0.0 | 1.1 | 16.9 | 16.9 | 15.8 | 0.0 | 14.7 | 0.4 | 0.0 | 0.8 |
| Cycle Q Clear(g_c), s | 0.3 | 4.6 | 0.0 | 1.1 | 16.9 | 16.9 | 15.8 | 0.0 | 14.7 | 0.4 | 0.0 | 0.8 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.02 | 1.00 | | 0.97 | 1.00 | | 0.50 |
| Lane Grp Cap(c), veh/h | 159 | 840 | 450 | 405 | 524 | 549 | 939 | 0 | 513 | 185 | 0 | 104 |
| V/C Ratio(X) | 0.07 | 0.30 | 0.00 | 0.10 | 0.86 | 0.86 | 0.88 | 0.00 | 0.75 | 0.06 | 0.00 | 0.21 |
| Avail Cap(c_a), veh/h | 373 | 908 | 486 | 583 | 528 | 553 | 1006 | 0 | 628 | 399 | 0 | 400 |
| 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 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 18.9 | 19.2 | 0.0 | 16.6 | 22.4 | 22.4 | 23.8 | 0.0 | 20.7 | 29.7 | 0.0 | 30.6 |
| Incr Delay (d2), s/veh | 0.2 | 0.2 | 0.0 | 0.1 | 13.6 | 13.1 | 8.9 | 0.0 | 3.9 | 0.1 | 0.0 | 1.0 |
| 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(95%),veh/ln | 0.3 | 3.4 | 0.0 | 1.0 | 15.2 | 15.7 | 13.4 | 0.0 | 11.3 | 0.4 | 0.0 | 0.8 |
| LnGrp Delay(d),s/veh | 19.1 | 19.4 | 0.0 | 16.7 | 36.1 | 35.5 | 32.7 | 0.0 | 24.6 | 29.8 | 0.0 | 31.6 |
| LnGrp LOS | B | B | | B | D | D | C | | C | C | | C |
| Approach Vol, veh/h | | 263 | | | 966 | | | 1211 | | | 33 | |
| Approach Delay, s/veh | | 19.4 | | | 35.0 | | | 30.1 | | | 31.0 | |
| Approach LOS | | B | | | C | | | C | | | C | |

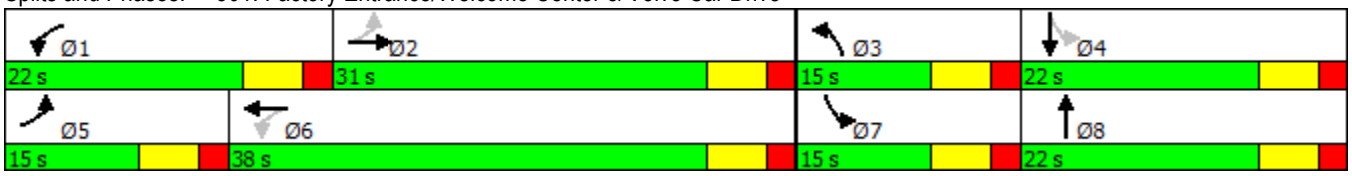
| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Phs Duration (G+Y+Rc), s | 8.2 | 25.4 | 24.7 | 10.2 | 6.8 | 26.8 | 6.8 | 28.1 |
| Change Period (Y+Rc), s | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Max Green Setting (Gmax), s | 9.0 | 21.0 | 20.0 | 16.0 | 9.0 | 21.0 | 9.0 | 27.0 |
| Max Q Clear Time (g_c+I1), s | 3.1 | 6.6 | 17.8 | 2.8 | 2.3 | 18.9 | 2.4 | 16.7 |
| Green Ext Time (p_c), s | 0.0 | 12.1 | 0.9 | 1.3 | 0.0 | 1.9 | 0.0 | 1.2 |

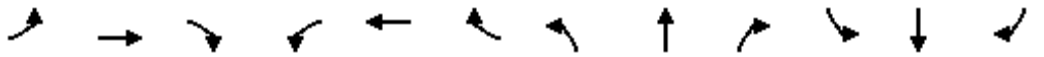
| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 30.9 |
| HCM 2010 LOS | C |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 10 | 769 | 745 | 335 | 115 | 83 | 10 | 10 | 10 |
| Future Volume (vph) | 10 | 769 | 745 | 335 | 115 | 83 | 10 | 10 | 10 |
| Turn Type | pm+pt | NA | Free | pm+pt | NA | Prot | NA | pm+pt | NA |
| Protected Phases | 5 | 2 | | 1 | 6 | 3 | 8 | 7 | 4 |
| Permitted Phases | 2 | | Free | 6 | | | | 4 | |
| Detector Phase | 5 | 2 | | 1 | 6 | 3 | 8 | 7 | 4 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| Minimum Split (s) | 15.0 | 22.0 | | 15.0 | 22.0 | 15.0 | 22.0 | 15.0 | 22.0 |
| Total Split (s) | 15.0 | 31.0 | | 22.0 | 38.0 | 15.0 | 22.0 | 15.0 | 22.0 |
| Total Split (%) | 16.7% | 34.4% | | 24.4% | 42.2% | 16.7% | 24.4% | 16.7% | 24.4% |
| Yellow Time (s) | 4.0 | 4.0 | | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 6.0 | | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | | | | | | | | | |
| Recall Mode | None | Min | | None | Min | None | None | None | None |
| Act Effct Green (s) | 26.3 | 19.9 | 62.6 | 41.9 | 42.3 | 7.7 | 9.8 | 8.7 | 6.8 |
| Actuated g/C Ratio | 0.42 | 0.32 | 1.00 | 0.67 | 0.68 | 0.12 | 0.16 | 0.14 | 0.11 |
| v/c Ratio | 0.02 | 0.77 | 0.52 | 0.66 | 0.07 | 0.22 | 0.18 | 0.04 | 0.11 |
| Control Delay | 8.4 | 26.6 | 1.2 | 19.4 | 8.0 | 31.8 | 14.4 | 23.1 | 25.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 8.4 | 26.6 | 1.2 | 19.4 | 8.0 | 31.8 | 14.4 | 23.1 | 25.1 |
| LOS | A | C | A | B | A | C | B | C | C |
| Approach Delay | | 14.1 | | | 16.3 | | 25.5 | | 24.4 |
| Approach LOS | | B | | | B | | C | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 62.6 | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.77 | |
| Intersection Signal Delay: 15.4 | Intersection LOS: B |
| Intersection Capacity Utilization 63.9% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 301: Factory Entrance/Welcome Center & Volvo Car Drive





| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 10 | 769 | 745 | 335 | 115 | 10 | 83 | 10 | 37 | 10 | 10 | 10 |
| Future Volume (veh/h) | 10 | 769 | 745 | 335 | 115 | 10 | 83 | 10 | 37 | 10 | 10 | 10 |
| Number | 5 | 2 | 12 | 1 | 6 | 16 | 3 | 8 | 18 | 7 | 4 | 14 |
| 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 | 1863 | 1845 | 1863 | 1863 | 1578 | 1900 | 1863 | 1863 | 1900 | 1863 | 1863 | 1900 |
| Adj Flow Rate, veh/h | 11 | 854 | 0 | 372 | 128 | 11 | 92 | 11 | 41 | 11 | 11 | 11 |
| Adj No. of Lanes | 1 | 2 | 1 | 1 | 2 | 0 | 2 | 1 | 0 | 1 | 1 | 0 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | 2 | 3 | 2 | 2 | 22 | 22 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 584 | 1270 | 574 | 499 | 1431 | 122 | 174 | 31 | 114 | 199 | 42 | 42 |
| Arrive On Green | 0.01 | 0.36 | 0.00 | 0.16 | 0.51 | 0.51 | 0.05 | 0.09 | 0.09 | 0.01 | 0.05 | 0.05 |
| Sat Flow, veh/h | 1774 | 3505 | 1583 | 1774 | 2797 | 238 | 3442 | 346 | 1289 | 1774 | 856 | 856 |
| Grp Volume(v), veh/h | 11 | 854 | 0 | 372 | 68 | 71 | 92 | 0 | 52 | 11 | 0 | 22 |
| Grp Sat Flow(s),veh/h/ln | 1774 | 1752 | 1583 | 1774 | 1499 | 1536 | 1721 | 0 | 1635 | 1774 | 0 | 1712 |
| Q Serve(g_s), s | 0.2 | 13.0 | 0.0 | 7.5 | 1.5 | 1.5 | 1.7 | 0.0 | 1.9 | 0.4 | 0.0 | 0.8 |
| Cycle Q Clear(g_c), s | 0.2 | 13.0 | 0.0 | 7.5 | 1.5 | 1.5 | 1.7 | 0.0 | 1.9 | 0.4 | 0.0 | 0.8 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.15 | 1.00 | | 0.79 | 1.00 | | 0.50 |
| Lane Grp Cap(c), veh/h | 584 | 1270 | 574 | 499 | 767 | 786 | 174 | 0 | 144 | 199 | 0 | 84 |
| V/C Ratio(X) | 0.02 | 0.67 | 0.00 | 0.75 | 0.09 | 0.09 | 0.53 | 0.00 | 0.36 | 0.06 | 0.00 | 0.26 |
| Avail Cap(c_a), veh/h | 816 | 1380 | 623 | 661 | 767 | 786 | 488 | 0 | 412 | 431 | 0 | 431 |
| 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 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 12.5 | 17.1 | 0.0 | 11.6 | 7.9 | 7.9 | 29.4 | 0.0 | 27.3 | 28.2 | 0.0 | 29.1 |
| Incr Delay (d2), s/veh | 0.0 | 1.2 | 0.0 | 3.2 | 0.0 | 0.0 | 2.5 | 0.0 | 1.5 | 0.1 | 0.0 | 1.6 |
| 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(95%),veh/ln | 0.2 | 10.7 | 0.0 | 7.1 | 1.1 | 1.2 | 1.5 | 0.0 | 1.6 | 0.3 | 0.0 | 0.7 |
| LnGrp Delay(d),s/veh | 12.6 | 18.2 | 0.0 | 14.8 | 8.0 | 8.0 | 31.9 | 0.0 | 28.8 | 28.3 | 0.0 | 30.7 |
| LnGrp LOS | B | B | | B | A | A | C | | C | C | | C |
| Approach Vol, veh/h | | 865 | | | 511 | | | 144 | | | 33 | |
| Approach Delay, s/veh | | 18.2 | | | 12.9 | | | 30.8 | | | 29.9 | |
| Approach LOS | | B | | | B | | | C | | | 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 | 16.2 | 29.0 | 9.2 | 9.1 | 6.7 | 38.5 | 6.7 | 11.6 |
| 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 | 16.0 | 25.0 | 9.0 | 16.0 | 9.0 | 32.0 | 9.0 | 16.0 |
| Max Q Clear Time (g_c+I1), s | 9.5 | 15.0 | 3.7 | 2.8 | 2.2 | 3.5 | 2.4 | 3.9 |
| Green Ext Time (p_c), s | 0.7 | 8.0 | 0.1 | 0.1 | 0.0 | 19.3 | 0.0 | 0.1 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 17.9 |
| HCM 2010 LOS | B |

# Appendix H

# 2039 Weaving Analysis Worksheets

HCS 2010: Freeway Weaving Release 6.60

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency/Co.: | Stantec |
| Date Performed: | 6/16/16 |
| Analysis Time Period: | 5:30a-6:30a |
| Freeway/Dir of Travel: | Volvo Car Drive |
| Weaving Location: | |
| Analysis Year: | 2039 |
| Description: | Weave Distance Less Queue (2%HV) |

## Inputs

| | | |
|---|---|---|
| Segment Type | C-D Roadway/ Multilane Highways | |
| Weaving configuration | One-Sided | |
| Number of lanes, N | 3 | ln |
| Weaving segment length, LS | 2840 | ft |
| Freeway free-flow speed, FFS | 45 | mi/h |
| Minimum segment speed, SMIN | 15 | mi/h |
| Freeway maximum capacity, cIFL | 1800* | pc/h/ln |
| Terrain type | Level | |
| Grade | 0.00 | % |
| Length | 0.00 | mi |

## Conversion to pc/h Under Base Conditions

| | Volume Components | | | | |
|---|---|---|---|---|---|
| | VFF | VRF | VFR | VRR | |
| Volume, V | 1251 | 263 | 10 | 10 | veh/h |
| Peak hour factor, PHF | 0.90 | 0.90 | 0.90 | 0.90 | |
| Peak 15-min volume, v15 | 348 | 73 | 3 | 3 | |
| Trucks and buses | 2 | 2 | 2 | 2 | % |
| Recreational vehicles | 0 | 0 | 0 | 0 | % |
| Trucks and buses PCE, ET | 1.5 | 1.5 | 1.5 | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | 1.2 | 1.2 | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.990 | 0.990 | 0.990 | 0.990 | |
| Driver population adjustment, fP | 1.00 | 1.00 | 1.00 | 1.00 | |
| Flow rate, v | 1404 | 295 | 11 | 11 | pc/h |

Volume ratio, VR 0.178

## Configuration Characteristics

| | | |
|---|---|---|
| Number of maneuver lanes, NWL | 2 | ln |
| Interchange density, ID | 0.0 | int/mi |
| Minimum RF lane changes, LCRF | 2 | lc/pc |
| Minimum FR lane changes, LCFR | 1 | lc/pc |
| Minimum RR lane changes, LCRR | | lc/pc |
| Minimum weaving lane changes, LCMIN | 601 | lc/h |
| Weaving lane changes, LCW | 778 | lc/h |
| Non-weaving vehicle index, INW | 0 | |
| Non-weaving lane change, LCNW | 1253 | lc/h |
| Total lane changes, LCALL | 2031 | lc/h |

## Weaving and Non-Weaving Speeds

Weaving intensity factor, W 0.173

| | | |
|---|---|---|
| Average weaving speed, SW | 40.6 | mi/h |
| Average non-weaving speed, SNW | 37.9 | mi/h |

### Weaving Segment Speed, Density, Level of Service and Capacity

| | | |
|---|---|---|
| Weaving segment speed, S | 38.4 | mi/h |
| Weaving segment density, D | 15.0 | pc/mi/ln |
| Level of service, LOS | B | |
| Weaving segment v/c ratio | 0.340 | |
| Weaving segment flow rate, v | 1705 | veh/h |
| Weaving segment capacity, cW | 5011 | veh/h |

### Limitations on Weaving Segments

If limit reached, see note.

| | Minimum | Maximum | Actual | Note |
|---|---|---|---|---|
| Weaving length (ft) | 300 | 4311 | 2840 | a,b |
| | | Maximum | Analyzed | |
| Density-based capacty, cIWL (pc/h/ln) | | 1800* | 1687 | c |
| | | Maximum | Analyzed | |
| v/c ratio | | 1.00 | 0.340 | d |

Notes:

a. In weaving segments shorter than 300 ft, weaving vehicles are assumed to make only necessary lane changes.
b. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments."
c. The density-based capacity exceeds the capacity of a basic freeway segment, under equivalent ideal conditions.
d. Volumes exceed the weaving segment capacity. The level of service is F.

HCS 2010: Freeway Weaving Release 6.60

Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency/Co.: | Stantec |
| Date Performed: | 6/16/16 |
| Analysis Time Period: | 5:30a-6:30a |
| Freeway/Dir of Travel: | Volvo Car Drive |
| Weaving Location: | |
| Analysis Year: | 2039 |
| Description: | Weave Distance Less Queue (20%HV) |

## Inputs

| | | |
|---|---|---|
| Segment Type | C-D Roadway/ Multilane Highways | |
| Weaving configuration | One-Sided | |
| Number of lanes, N | 3 | ln |
| Weaving segment length, LS | 2840 | ft |
| Freeway free-flow speed, FFS | 45 | mi/h |
| Minimum segment speed, SMIN | 15 | mi/h |
| Freeway maximum capacity, cIFL | 1800* | pc/h/ln |
| Terrain type | Level | |
| Grade | 0.00 | % |
| Length | 0.00 | mi |

## Conversion to pc/h Under Base Conditions

| | Volume Components | | | | |
|---|---|---|---|---|---|
| | VFF | VRF | VFR | VRR | |
| Volume, V | 1251 | 263 | 10 | 10 | veh/h |
| Peak hour factor, PHF | 0.90 | 0.90 | 0.90 | 0.90 | |
| Peak 15-min volume, v15 | 348 | 73 | 3 | 3 | |
| Trucks and buses | 20 | 20 | 20 | 20 | % |
| Recreational vehicles | 0 | 0 | 0 | 0 | % |
| Trucks and buses PCE, ET | 1.5 | 1.5 | 1.5 | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | 1.2 | 1.2 | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | 0.909 | 0.909 | 0.909 | |
| Driver population adjustment, fP | 1.00 | 1.00 | 1.00 | 1.00 | |
| Flow rate, v | 1529 | 321 | 12 | 12 | pc/h |

Volume ratio, VR 0.178

## Configuration Characteristics

| | | |
|---|---|---|
| Number of maneuver lanes, NWL | 2 | ln |
| Interchange density, ID | 0.0 | int/mi |
| Minimum RF lane changes, LCRF | 2 | lc/pc |
| Minimum FR lane changes, LCFR | 1 | lc/pc |
| Minimum RR lane changes, LCRR | | lc/pc |
| Minimum weaving lane changes, LCMIN | 654 | lc/h |
| Weaving lane changes, LCW | 831 | lc/h |
| Non-weaving vehicle index, INW | 0 | |
| Non-weaving lane change, LCNW | 1279 | lc/h |
| Total lane changes, LCALL | 2110 | lc/h |

## Weaving and Non-Weaving Speeds

Weaving intensity factor, W 0.179

| | | |
|---|---|---|
| Average weaving speed, SW | 40.5 | mi/h |
| Average non-weaving speed, SNW | 37.3 | mi/h |

### Weaving Segment Speed, Density, Level of Service and Capacity

| | | |
|---|---|---|
| Weaving segment speed, S | 37.8 | mi/h |
| Weaving segment density, D | 16.5 | pc/mi/ln |
| Level of service, LOS | B | |
| Weaving segment v/c ratio | 0.370 | |
| Weaving segment flow rate, v | 1705 | veh/h |
| Weaving segment capacity, cW | 4604 | veh/h |

### Limitations on Weaving Segments

If limit reached, see note.

| | Minimum | Maximum | Actual | Note |
|---|---|---|---|---|
| Weaving length (ft) | 300 | 4309 | 2840 | a,b |
| | | Maximum | Analyzed | |
| Density-based capacty, cIWL (pc/h/ln) | | 1800* | 1688 | c |
| | | Maximum | Analyzed | |
| v/c ratio | | 1.00 | 0.370 | d |

Notes:

a. In weaving segments shorter than 300 ft, weaving vehicles are assumed to make only necessary lane changes.
b. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments."
c. The density-based capacity exceeds the capacity of a basic freeway segment, under equivalent ideal conditions.
d. Volumes exceed the weaving segment capacity. The level of service is F.

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Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency/Co.: | Stantec |
| Date Performed: | 6/16/16 |
| Analysis Time Period: | 3:00p-4:00p |
| Freeway/Dir of Travel: | Volvo Car Drive |
| Weaving Location: | |
| Analysis Year: | 2039 |
| Description: | Weave Distance Less Queue (16%HV) |

## Inputs

| | | |
|---|---|---|
| Segment Type | C-D Roadway/ Multilane Highways | |
| Weaving configuration | One-Sided | |
| Number of lanes, N | 3 | ln |
| Weaving segment length, LS | 3025 | ft |
| Freeway free-flow speed, FFS | 45 | mi/h |
| Minimum segment speed, SMIN | 15 | mi/h |
| Freeway maximum capacity, cIFL | 1800* | pc/h/ln |
| Terrain type | Level | |
| Grade | 0.00 | % |
| Length | 0.00 | mi |

## Conversion to pc/h Under Base Conditions

| | Volume Components | | | | |
|---|---|---|---|---|---|
| | VFF | VRF | VFR | VRR | |
| Volume, V | 260 | 50 | 10 | 10 | veh/h |
| Peak hour factor, PHF | 0.90 | 0.90 | 0.90 | 0.90 | |
| Peak 15-min volume, v15 | 72 | 14 | 3 | 3 | |
| Trucks and buses | 16 | 16 | 16 | 16 | % |
| Recreational vehicles | 0 | 0 | 0 | 0 | % |
| Trucks and buses PCE, ET | 1.5 | 1.5 | 1.5 | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | 1.2 | 1.2 | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.926 | 0.926 | 0.926 | 0.926 | |
| Driver population adjustment, fP | 1.00 | 1.00 | 1.00 | 1.00 | |
| Flow rate, v | 312 | 60 | 12 | 12 | pc/h |
| Volume ratio, VR | | 0.182 | | | |

## Configuration Characteristics

| | | |
|---|---|---|
| Number of maneuver lanes, NWL | 2 | ln |
| Interchange density, ID | 0.0 | int/mi |
| Minimum RF lane changes, LCRF | 2 | lc/pc |
| Minimum FR lane changes, LCFR | 1 | lc/pc |
| Minimum RR lane changes, LCRR | | lc/pc |
| Minimum weaving lane changes, LCMIN | 132 | lc/h |
| Weaving lane changes, LCW | 315 | lc/h |
| Non-weaving vehicle index, INW | 0 | |
| Non-weaving lane change, LCNW | 1128 | lc/h |
| Total lane changes, LCALL | 1443 | lc/h |

## Weaving and Non-Weaving Speeds

| | |
|---|---|
| Weaving intensity factor, W | 0.126 |

| | | |
|---|---|---|
| Average weaving speed, SW | 41.6 | mi/h |
| Average non-weaving speed, SNW | 43.4 | mi/h |

### Weaving Segment Speed, Density, Level of Service and Capacity

| | | |
|---|---|---|
| Weaving segment speed, S | 43.1 | mi/h |
| Weaving segment density, D | 3.1+ | pc/mi/ln |
| Level of service, LOS | A | |
| Weaving segment v/c ratio | 0.078 | |
| Weaving segment flow rate, v | 367 | veh/h |
| Weaving segment capacity, cW | 4719 | veh/h |

### Limitations on Weaving Segments

If limit reached, see note.

| | Minimum | Maximum | Actual | Note |
|---|---|---|---|---|
| Weaving length (ft) | 300 | 4351 | 3025 | a,b |
| | | Maximum | Analyzed | |
| Density-based capacty, cIWL (pc/h/ln) | | 1800* | 1699 | c |
| | | Maximum | Analyzed | |
| v/c ratio | | 1.00 | 0.078 | d |

Notes:

a. In weaving segments shorter than 300 ft, weaving vehicles are assumed to make only necessary lane changes.
b. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments."
c. The density-based capacity exceeds the capacity of a basic freeway segment, under equivalent ideal conditions.
d. Volumes exceed the weaving segment capacity. The level of service is F.

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Phone: Fax:
E-mail:

## Operational Analysis

| | |
|---|---|
| Analyst: | ae |
| Agency/Co.: | Stantec |
| Date Performed: | 6/16/16 |
| Analysis Time Period: | 3:00p-4:00p |
| Freeway/Dir of Travel: | Volvo Car Drive |
| Weaving Location: | |
| Analysis Year: | 2039 |
| Description: | Weave Distance Less Queue (20%HV) |

## Inputs

| | | |
|---|---|---|
| Segment Type | C-D Roadway/ Multilane Highways | |
| Weaving configuration | One-Sided | |
| Number of lanes, N | 3 | ln |
| Weaving segment length, LS | 3025 | ft |
| Freeway free-flow speed, FFS | 45 | mi/h |
| Minimum segment speed, SMIN | 15 | mi/h |
| Freeway maximum capacity, cIFL | 1800* | pc/h/ln |
| Terrain type | Level | |
| Grade | 0.00 | % |
| Length | 0.00 | mi |

## Conversion to pc/h Under Base Conditions

| | Volume Components | | | | |
|---|---|---|---|---|---|
| | VFF | VRF | VFR | VRR | |
| Volume, V | 260 | 50 | 10 | 10 | veh/h |
| Peak hour factor, PHF | 0.90 | 0.90 | 0.90 | 0.90 | |
| Peak 15-min volume, v15 | 72 | 14 | 3 | 3 | |
| Trucks and buses | 20 | 20 | 20 | 20 | % |
| Recreational vehicles | 0 | 0 | 0 | 0 | % |
| Trucks and buses PCE, ET | 1.5 | 1.5 | 1.5 | 1.5 | |
| Recreational vehicle PCE, ER | 1.2 | 1.2 | 1.2 | 1.2 | |
| Heavy vehicle adjustment, fHV | 0.909 | 0.909 | 0.909 | 0.909 | |
| Driver population adjustment, fP | 1.00 | 1.00 | 1.00 | 1.00 | |
| Flow rate, v | 318 | 61 | 12 | 12 | pc/h |

Volume ratio, VR 0.181

## Configuration Characteristics

| | | |
|---|---|---|
| Number of maneuver lanes, NWL | 2 | ln |
| Interchange density, ID | 0.0 | int/mi |
| Minimum RF lane changes, LCRF | 2 | lc/pc |
| Minimum FR lane changes, LCFR | 1 | lc/pc |
| Minimum RR lane changes, LCRR | | lc/pc |
| Minimum weaving lane changes, LCMIN | 134 | lc/h |
| Weaving lane changes, LCW | 317 | lc/h |
| Non-weaving vehicle index, INW | 0 | |
| Non-weaving lane change, LCNW | 1130 | lc/h |
| Total lane changes, LCALL | 1447 | lc/h |

## Weaving and Non-Weaving Speeds

Weaving intensity factor, W 0.126

| | | |
|---|---|---|
| Average weaving speed, SW | 41.6 | mi/h |
| Average non-weaving speed, SNW | 43.4 | mi/h |

## Weaving Segment Speed, Density, Level of Service and Capacity

| | | |
|---|---|---|
| Weaving segment speed, S | 43.1 | mi/h |
| Weaving segment density, D | 3.1+ | pc/mi/ln |
| Level of service, LOS | A | |
| Weaving segment v/c ratio | 0.079 | |
| Weaving segment flow rate, v | 367 | veh/h |
| Weaving segment capacity, cW | 4634 | veh/h |

## Limitations on Weaving Segments

If limit reached, see note.

| | Minimum | Maximum | Actual | Note |
|---|---|---|---|---|
| Weaving length (ft) | 300 | 4344 | 3025 | a,b |
| | | Maximum | Analyzed | |
| Density-based capacty, cIWL (pc/h/ln) | | 1800* | 1699 | c |
| | | Maximum | Analyzed | |
| v/c ratio | | 1.00 | 0.079 | d |

Notes:

a. In weaving segments shorter than 300 ft, weaving vehicles are assumed to make only necessary lane changes.
b. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments."
c. The density-based capacity exceeds the capacity of a basic freeway segment, under equivalent ideal conditions.
d. Volumes exceed the weaving segment capacity. The level of service is F.