

---

To: Brent Dillon, P.E., PTOE  
State Traffic Design Engineer  
SCDOT

From: Jim Fisher, PE  
Stantec Consulting Services Inc.

File: 171001612

Date: August 22, 2016

---

**Reference: I-26 & Volvo Car Drive – Supplemental Analyses**

## **1.0 PURPOSE**

In support of the *I-26 & Volvo Car Drive Interchange Justification Report (IJR)* and in preparation for the associated design-build efforts, additional capacity analyses for the I-26 & Volvo Car Drive interchange were performed for the peak ingress hour (5:30-6:30 am). A weaving analysis was performed for the northbound direction of Volvo Car Drive between the point of convergence of the I-26 exit ramps and the Volvo Car Drive & Factory Entrance intersection. Peak ingress hour and design hour traffic volumes for opening-year 2019 conditions and horizon-year 2039 conditions were considered in these analyses. The *I-26 & Volvo Car Drive IJR* focuses on the 3:00-4:00 pm design hour, which corresponds to the peak egress of employees from the Volvo factory. The analyses detailed hereafter were conducted to assess the impact of the peak ingress time period and to provide additional guidance for detailed design efforts considering the proposed interchange and related facilities. The purpose of this memorandum is to document the procedures and findings of the additional analyses.

## **2.0 SELECTION OF AM DESIGN HOUR**

The *I-26 & Volvo Car Drive IJR* analyses focus on the 3:00-4:00 pm design hour, which corresponds to the 41<sup>st</sup> highest hour of traffic volume for I-26 and also corresponds with the peak egress hour of traffic anticipated to be generated by the Volvo factory. Additional analysis was desired to consider the peak ingress period of Volvo-related traffic, which is anticipated to be 5:30-6:30 am.

Following similar methodology as described in section 2.0 of the *I-26 & Volvo Car Drive IJR*, the 30<sup>th</sup> design hour was used to determine the appropriate traffic volume used for the peak ingress analysis.

As described in the Transportation Research Board's *Highway Capacity Manual 2010* and the Institute of Transportation Engineers' *Traffic Engineering Handbook*, 6<sup>th</sup> Edition, the 30<sup>th</sup> highest hour traffic volume should be used for the design hour traffic volume of rural highways. To narrow the scope of potential design hours for use in the peak ingress hour analysis, only hours within the time period of 5:00-7:00 am were evaluated.

The 30<sup>th</sup> highest hourly volume was determined by listing traffic volumes for 5:00-6:00 am and 6:00-7:00 am of every day in a calendar year in descending order from highest to lowest. The 30<sup>th</sup> volume in this list is the 30<sup>th</sup> 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.

**Reference: I-26 & Volvo Car Drive – Supplemental Analyses**

A review was conducted of available traffic data from South Carolina Department of Transportation's (SCDOT) Automatic Traffic Recorder (ATR) station P-54 along I-26 between SC 27/Ridgeville Road and Jedburg Road between May 2014 and April 2015. A graph of the volume data was created to identify a “knee” in the data—a point at which the initial steep slope becomes a more gradual linear slope. The 30<sup>th</sup> highest hour traffic volume for I-26 during the 5:00-7:00 am time period occurred on Wednesday, November 5, 2014 with a bidirectional volume of 2,151 vehicles from 6:00-7:00 am.

**3.0 TRAFFIC VOLUME DEVELOPMENT**

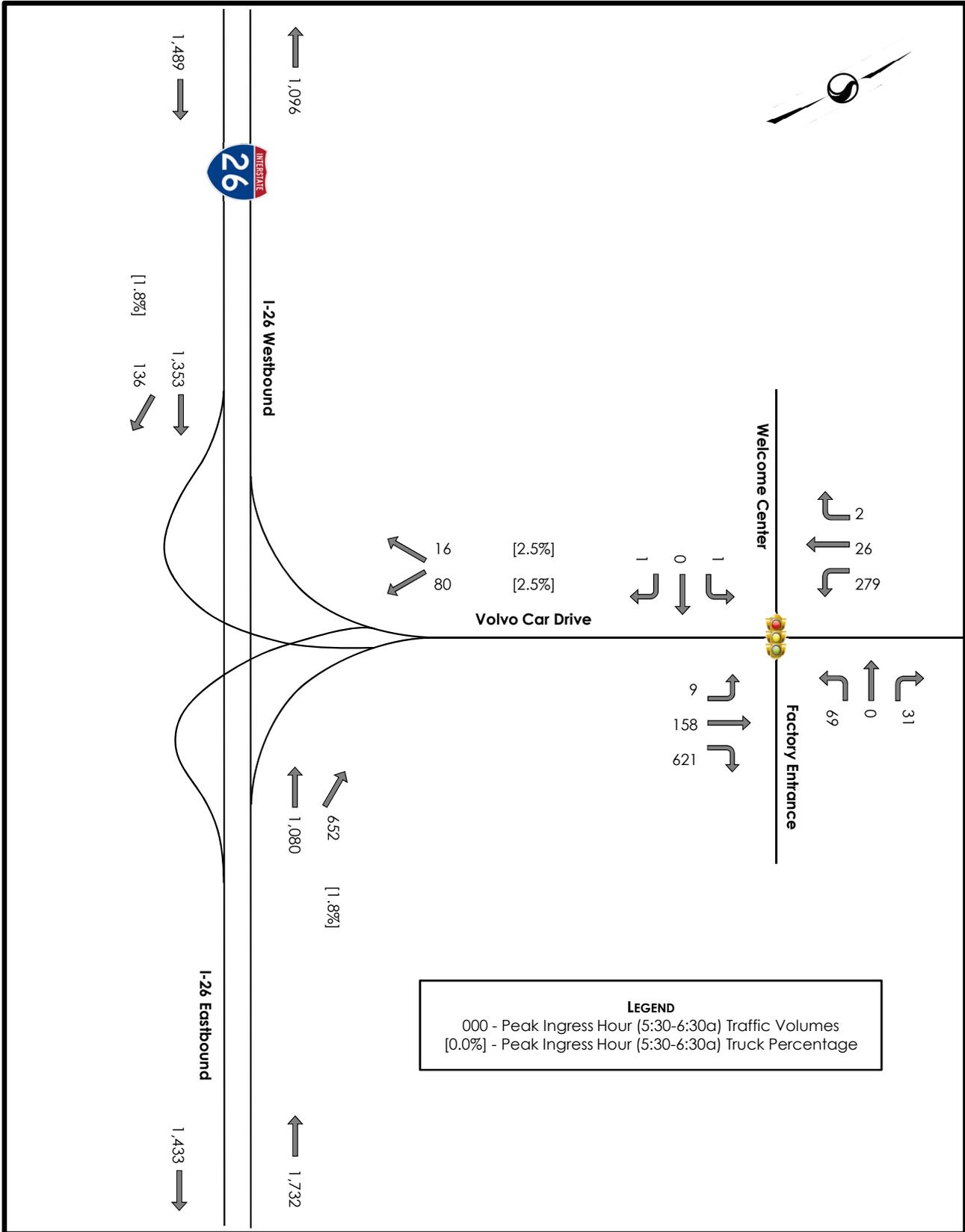
For the peak ingress analyses, the opening-year 2019 and horizon-year 2039 conditions were considered. The 2014 existing traffic volumes for I-26, as measured by SCDOT ATR station P-54 between SC 27/Ridgeville Road and Jedburg Road and as described in the previous section, were grown to future-year conditions using the 2.0% annual linear growth rate described in section 3.1 of the *I-26 & Volvo Car Drive IJR*.

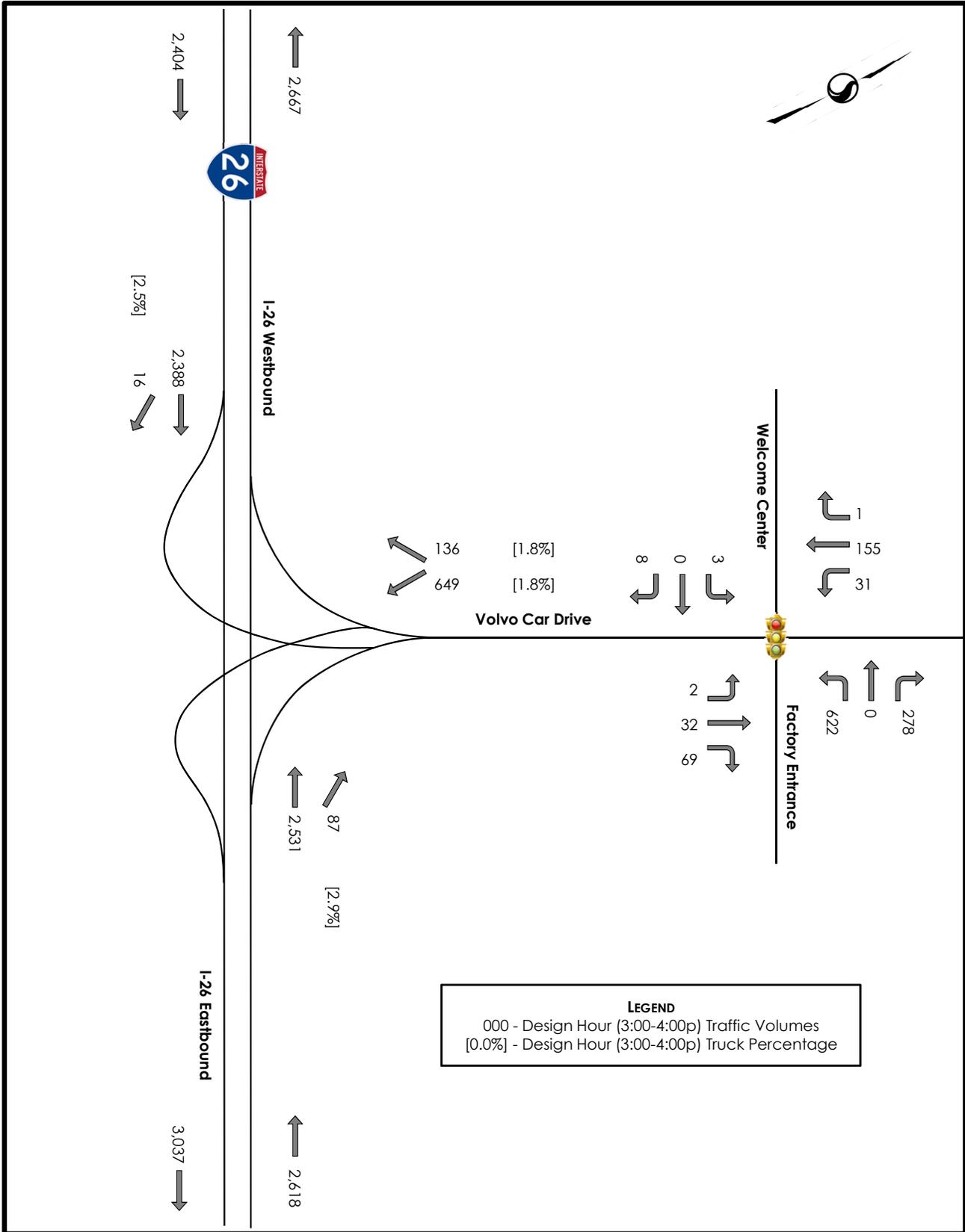
**3.1 OPENING-YEAR 2019 TRAFFIC VOLUMES**

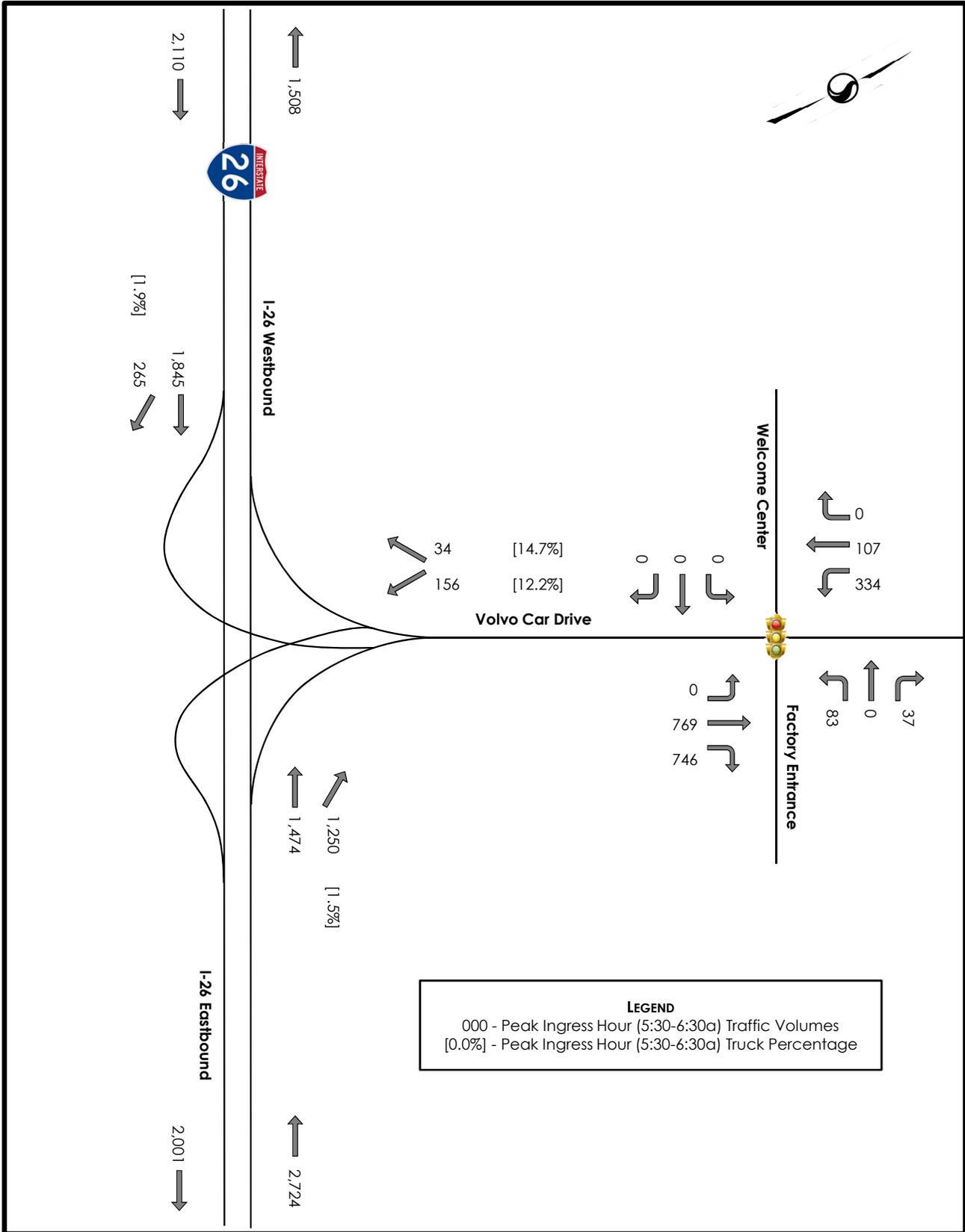
The opening-year 2019 traffic volumes were developed for projected 2019 conditions by applying the annual growth rate to the existing traffic volumes and adding the projected traffic volumes of the Volvo factory, Volvo-related industrial development, and construction traffic. The trip generation potential, shift-based hourly distribution, and the distribution and assignment of traffic to the adjacent roadway network were based on the assumptions described in sections 3.2.1, 3.2.2, and 3.2.3 of the *I-26 & Volvo Car Drive IJR*. The projected opening-year peak ingress hour traffic volumes for I-26, the Volvo Car Drive interchange, and the Volvo Car Drive & Factory Entrance intersection are shown in Exhibit 3.1. The projected opening-year design hour traffic volumes for I-26, the Volvo Car Drive interchange, and the Volvo Car Drive & Factory Entrance intersection are shown in Exhibit 3.2. Worksheets documenting the opening-year 2019 traffic volume development are provided in Attachment A.

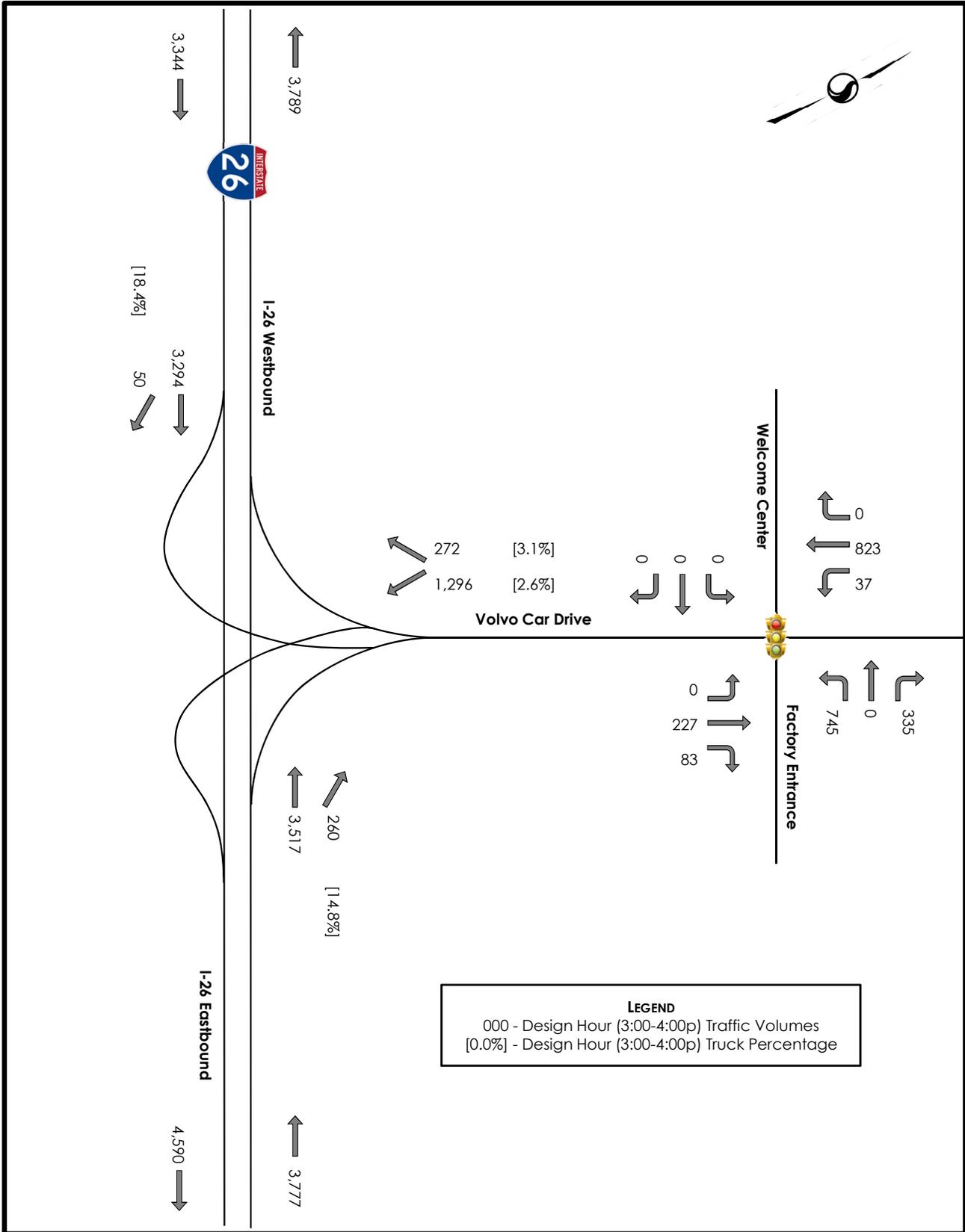
**3.2 HORIZON-YEAR 2039 TRAFFIC VOLUMES**

The horizon-year 2039 traffic volumes were developed for projected 2039 conditions by applying the annual growth rate to the existing traffic volumes and adding the projected traffic volumes of the Volvo factory and Volvo-related industrial development. The trip generation potential, shift-based hourly distribution, and the distribution and assignment of traffic to the adjacent roadway network were based on the assumptions described in sections 3.3.1, 3.3.2, and 3.3.3 of the *I-26 & Volvo Car Drive IJR*. The projected horizon-year peak ingress hour traffic volumes for I-26, the Volvo Car Drive interchange, and the Volvo Car Drive & Factory Entrance intersection are shown in Exhibit 3.3. The projected horizon-year design hour traffic volumes for I-26, the Volvo Car Drive interchange, and the Volvo Car Drive & Factory Entrance intersection are shown in Exhibit 3.4. Worksheets documenting the horizon-year 2039 traffic volume development are provided in Attachment B.









**Reference: I-26 & Volvo Car Drive – Supplemental Analyses**

**4.0 CAPACITY ANALYSIS**

Using the projected opening-year 2019 and horizon-year 2039 traffic volumes for the peak ingress hour and design hour, capacity analyses were conducted for the I-26 & Volvo Car Drive interchange freeway facilities, Volvo Car Drive northbound controlled-access facility, and the Volvo Car Drive & Factory Entrance intersection. These analyses were conducted 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. Table 4.1 below 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	Density (passenger cars/mile/lane)		Signalized Intersections	
	Multilane Weaving Segments	Basic Freeway Segments	LOS	Delay Per Vehicle (seconds)
A	≤ 12	≤ 11	A	≤ 10
B	> 12 and ≤ 24	> 11 and ≤ 18	B	> 10 and ≤ 20
C	> 24 and ≤ 32	> 18 and ≤ 26	C	> 20 and ≤ 35
D	> 32 and ≤ 36	> 26 and ≤ 35	D	> 35 and ≤ 55
E	> 36	> 35 and ≤ 45	E	> 55 and ≤ 80
F	Demand exceeds capacity	> 45	F	> 80

As part of the analyses, a peak hour factor of 0.90 was assumed for all freeway facilities and intersections. A heavy vehicle percentage of 20% was assumed for all freeway facility analyses while heavy vehicles percentages between 2% and 20% were assumed for the intersection analyses.

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 basic freeway segments.

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

**Reference: I-26 & Volvo Car Drive – Supplemental Analyses**

Drive. Access will be fully controlled to a point approximately 3,000 feet north of this point of convergence, which is near the intersection with the Volvo Factory Entrance.

**4.1 OPENING-YEAR 2019 ANALYSES**

As part of the 2019 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 to be in place.

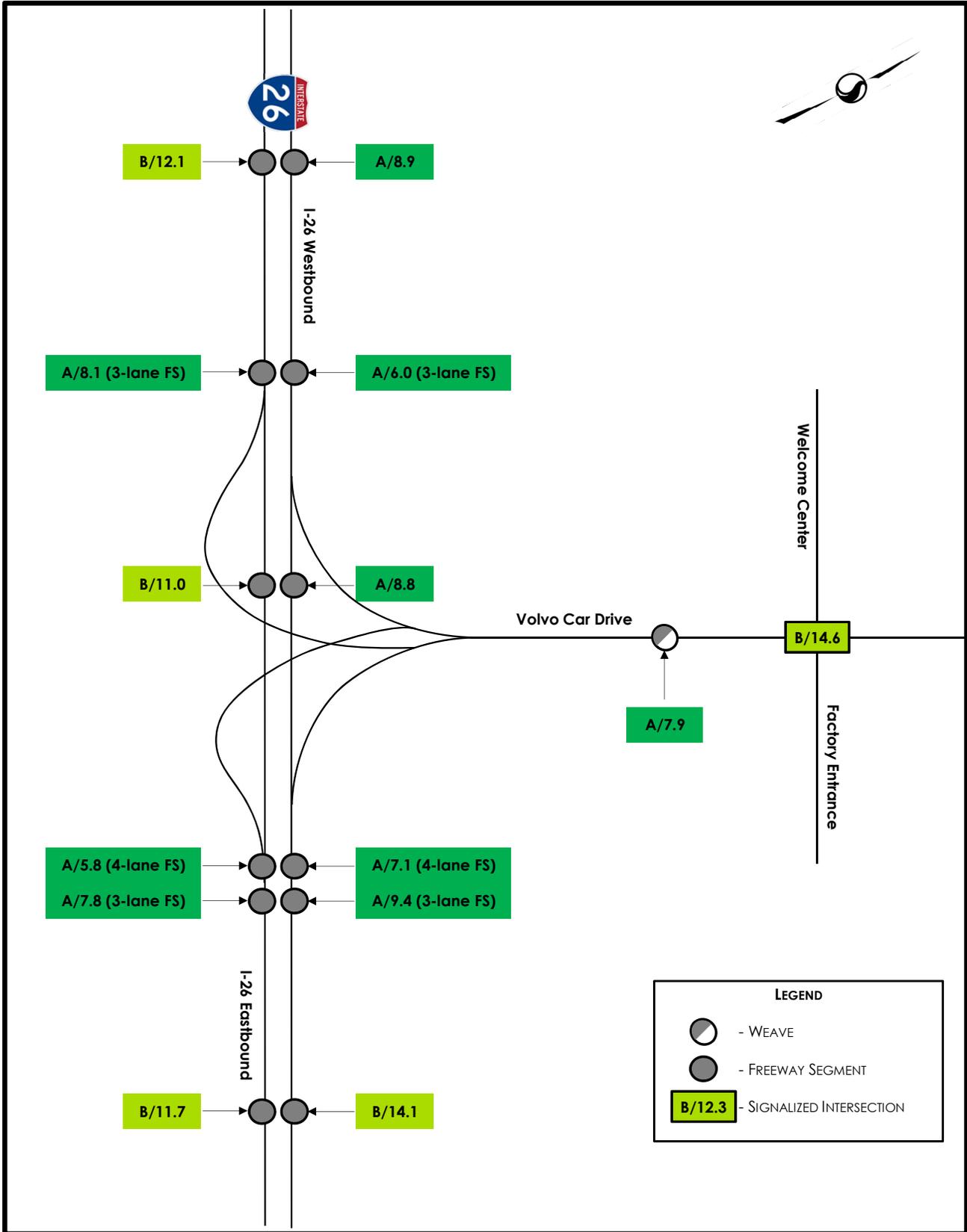
**4.1.1 FREEWAY FACILITY ANALYSES**

**PEAK INGRESS HOUR – OPENING-YEAR 2019**

The results of the freeway facility and weaving analyses considering opening-year 2019 conditions for the 5:30-6:30 am peak ingress hour are summarized below in Table 4.2 and are illustrated in Exhibit 4.1. The results indicate that for opening-year 2019 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 the 5:30-6:30 am peak ingress hour. The study area freeway facilities are projected to operate at acceptable conditions considering opening-year 2019 conditions. Worksheets documenting the freeway and weaving analyses for opening-year 2019 conditions during the 5:30-6:30 am peak ingress hour are included in Attachment C.

**Table 4.2 – 2019 Peak Ingress Hour LOS Results Summary**

Section	Eastbound					Westbound				
	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)
SC 27 to New Interchange	1,489	75.0	12.1	FS	B	A	FS	8.9	75.0	1,096
Three-Lane On/Off West of New Interchange	1,489	75.0	8.1	FS	A	A	FS	6.0	75.0	1,096
At New Interchange	1,353	75.0	11.0	FS	B	A	FS	8.8	75.0	1,080
Four-Lane On/Off East of New Interchange	1,433	75.0	5.8	FS	A	A	FS	7.1	75.0	1,732
Three-Lane On/Off East of New Interchange	1,433	75.0	7.8	FS	A	A	FS	9.4	75.0	1,732
New Interchange to Jedburg Road	1,433	75.0	11.7	FS	B	B	FS	14.1	75.0	1,732
Volvo Car Drive	788	40.7	7.9	W	A					

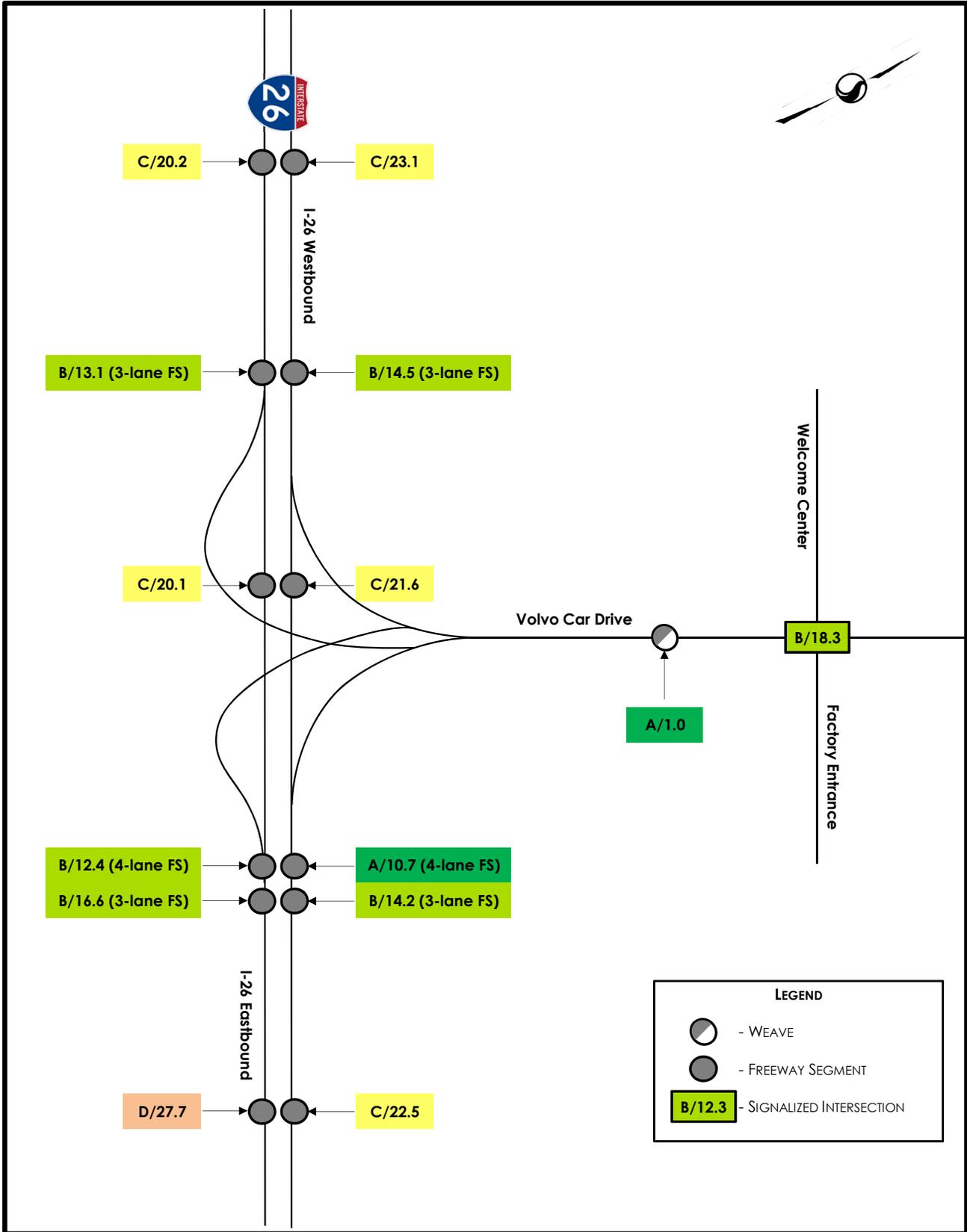


**Reference: I-26 & Volvo Car Drive – Supplemental Analyses**
**DESIGN HOUR – OPENING-YEAR 2019**

The results of the freeway facility and weaving analyses considering opening-year 2019 conditions for the 3:00-4:00 pm design hour are summarized below in Table 4.3 and are illustrated in Exhibit 4.2. The results indicate that for opening-year 2019 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 the 3:00-4:00 pm design hour. The study area freeway facilities are projected to operate at acceptable conditions considering opening-year 2019 conditions. Worksheets documenting the freeway analyses for opening-year 2019 conditions during the 3:00-4:00 pm design hour are included in Attachment D.

**Table 4.3 – 2019 Design Hour LOS Results Summary**

Section	Eastbound					Westbound				
	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)
SC 27 to New Interchange	2,404	72.6	20.2	FS	C	C	FS	23.1	70.6	2,667
Four-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
Five-Lane On/Off East of New Interchange	3,037	75.0	12.4	FS	B	A	FS	10.7	75.0	2,618
Four-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
Volvo Car Drive	103	44.1	1.0	W	A					



**Reference: I-26 & Volvo Car Drive – Supplemental Analyses**

**4.2 HORIZON-YEAR 2039 ANALYSES**

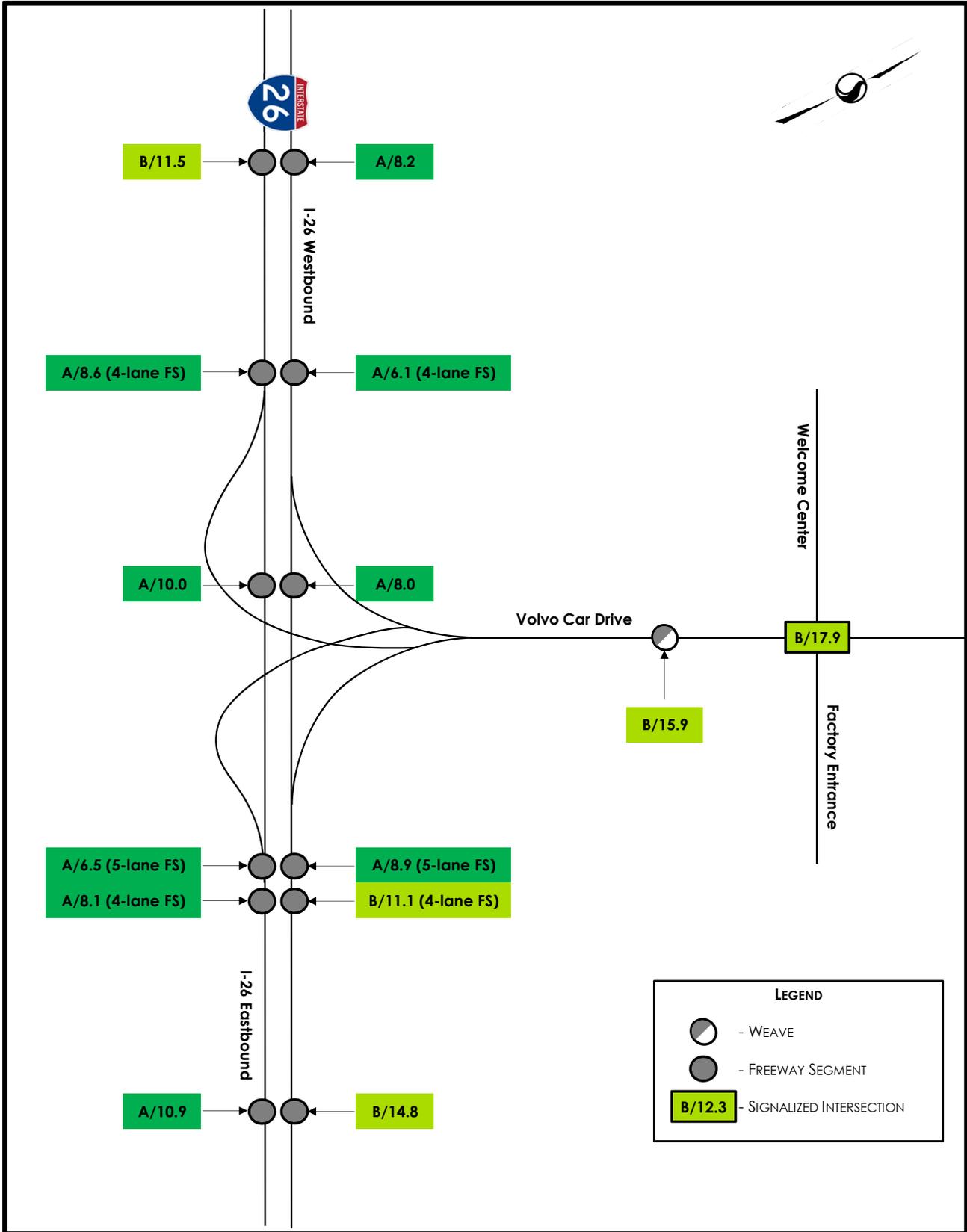
As part of the horizon-year 2039 analyses, the widening of I-26 to a six-lane section from west of SC 27/Ridgeville Road to east of Jedburg Road was assumed to be in place.

**PEAK INGRESS HOUR – HORIZON-YEAR 2039**

The results of the freeway facility and weaving analyses considering horizon-year 2039 conditions for the 5:30-6:30 am peak ingress hour are summarized below in Table 4.4 and are illustrated in Exhibit 4.3. The results indicate that for horizon-year 2039 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 the 3:00-4:00 pm design hour. The study area freeway facilities are projected to operate at acceptable conditions considering horizon-year 2039 conditions. Worksheets documenting the freeway analyses for horizon-year 2039 conditions during the 5:30-6:30 am peak ingress hour are included in Attachment E.

**Table 4.4 – 2039 Peak Ingress Hour LOS Results Summary**

Section	Eastbound					Westbound				
	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)
SC 27 to New Interchange	2,110	75.0	11.5	FS	<b>B</b>	<b>A</b>	FS	8.2	75.0	1,508
Four-Lane On/Off West of New Interchange	2,110	75.0	8.6	FS	<b>A</b>	<b>A</b>	FS	6.1	75.0	1,508
At New Interchange	1,845	75.0	10.0	FS	<b>A</b>	<b>A</b>	FS	8.0	75.0	1,474
Five-Lane On/Off East of New Interchange	2,001	75.0	6.5	FS	<b>A</b>	<b>A</b>	FS	8.9	75.0	2,724
Four-Lane On/Off East of New Interchange	2,001	75.0	8.1	FS	<b>A</b>	<b>B</b>	FS	11.1	75.0	2,724
New Interchange to Jedburg Road	2,001	75.0	10.9	FS	<b>A</b>	<b>B</b>	FS	14.8	74.9	2,724
Volvo Car Drive	1,515	38.8	15.9	W	<b>B</b>					



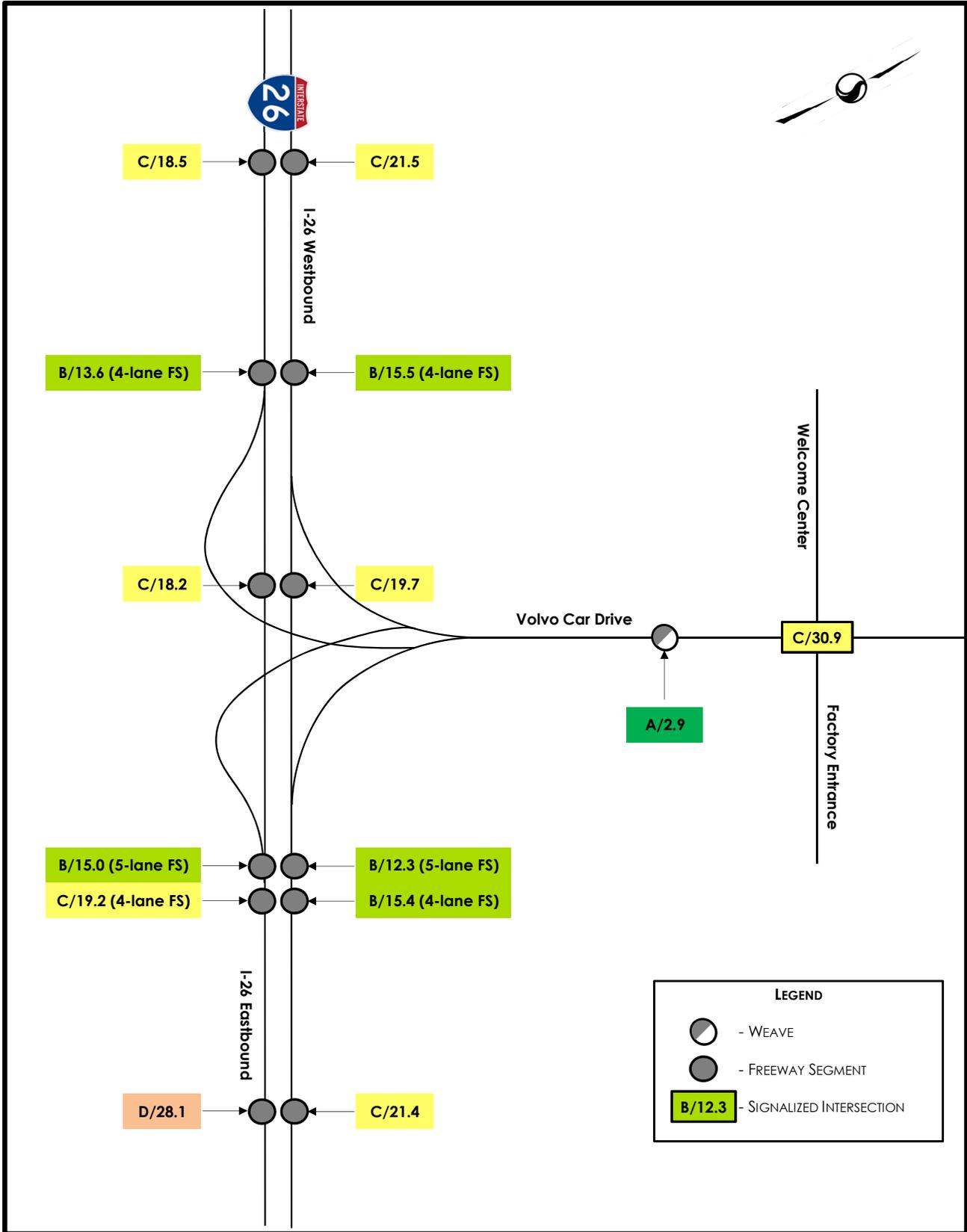
**Reference: I-26 & Volvo Car Drive – Supplemental Analyses**

**DESIGN HOUR – HORIZON-YEAR 2039**

The results of the freeway facility and weaving analyses considering horizon-year 2039 conditions for the 3:00-4:00 pm design hour are summarized below in Table 4.5 and are illustrated in Exhibit 4.4. The results indicate that for horizon-year 2039 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 the 3:00-4:00 pm design hour. The study area freeway facilities are projected to operate at acceptable conditions considering horizon-year 2039 conditions. Worksheets documenting the freeway analyses for horizon-year 2039 conditions during the 3:00-4:00 pm design hour are included in Attachment F.

**Table 4.5 – 2039 Design Hour LOS Results Summary**

Section	Eastbound					Westbound				
	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)
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
Volvo Car Drive	310	43.9	2.9	W	A					



LEGEND	
	- WEAVE
	- FREEWAY SEGMENT
	- SIGNALIZED INTERSECTION

**Reference: I-26 & Volvo Car Drive – Supplemental Analyses**

## **5.0 SUMMARY**

The results of the capacity analyses considering the peak ingress hour of the Volvo factory indicate that the I-26 & Volvo Car Drive interchange freeway facilities are projected to operate at an acceptable level of service in both the opening-year 2019 and horizon-year 2039 conditions.

Additionally, the results of the weaving analyses for the northbound segment of Volvo Car Drive from the convergence of the I-26 exit ramps to the Volvo Car Drive & Factory Entrance intersection indicate that the weaving segment is projected to operate at an acceptable level of service during the peak ingress hour in both the opening-year 2019 and horizon-year 2039 conditions.

Please contact me at your earliest convenience if you have any questions or comments.

**STANTEC CONSULTING SERVICES INC.**



Jim Fisher, PE  
Senior Transportation Engineer  
Phone: (843) 740-6325  
Jim.Fisher@stantec.com

Attachments:

- A. Opening-Year 2019 Volume Development Worksheet
- B. Horizon-Year 2039 Volume Development Worksheet
- C. Opening-Year 2019 Peak Ingress Hour Freeway and Weaving Analyses Worksheets
- D. Opening-Year 2019 Design Hour Freeway and Weaving Analyses Worksheets
- E. Horizon-Year 2039 Peak Ingress Hour Freeway and Weaving Analyses Worksheets
- F. Horizon-Year 2039 Design Hour Freeway and Weaving Analyses Worksheets

**I-26 & Volvo Car Drive – Supplemental Analyses**

**Attachment A**

**Opening-Year 2019 Volume Development Worksheet**

# 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	9		621	279		2	69		31	1		1
Camp Hall Traffic		33			13							
Construction Traffic		125			13							
<b>2019 BUILD TRAFFIC VOLUMES</b>	<b>9</b>	<b>158</b>	<b>621</b>	<b>279</b>	<b>26</b>	<b>2</b>	<b>69</b>	<b>0</b>	<b>31</b>	<b>1</b>	<b>0</b>	<b>1</b>

# 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	2		69	31		1	622		278	3		8
Camp Hall Traffic		19			30							
Construction Traffic		13			125							
<b>2019 BUILD TRAFFIC VOLUMES</b>	<b>2</b>	<b>32</b>	<b>69</b>	<b>31</b>	<b>155</b>	<b>1</b>	<b>622</b>	<b>0</b>	<b>278</b>	<b>3</b>	<b>0</b>	<b>8</b>

## TRAFFIC VOLUME DEVELOPMENT

**I-26**

**DATE COUNTED: Wednesday, November 5, 2014**

INGRESS PEAK HOUR (5:30-6:30 AM*)	SC 27 to Volvo Car Drive		Volvo Car Drive To Jedburg Road	
	EB	WB	EB	WB
<b>2014 TRAFFIC VOLUMES</b>	<b>1,218</b>	<b>933</b>	<b>1,218</b>	<b>933</b>
<b>2015 TRAFFIC VOLUMES</b>	<b>1,242</b>	<b>952</b>	<b>1,242</b>	<b>952</b>
Years To Buildout (2019)	4	4	4	4
Yearly Growth Rate	2.0%	2.0%	2.0%	2.0%
Background Traffic Growth	99	76	99	76
Volvo Traffic	113	39	61	547
Camp Hall Traffic	12	22	19	49
Construction Traffic	23	7	12	108
<b>2019 BUILD TRAFFIC VOLUMES</b>	<b>1,489</b>	<b>1,096</b>	<b>1,433</b>	<b>1,732</b>

\*I-26 freeway volumes are developed using 2014 volumes for the hour of 6:00-7:00 AM.

**I-26 & Volvo Car Drive – Supplemental Analyses**

**Attachment B**

**Horizon-Year 2039 Volume Development Worksheet**

# 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		769	746	334	107		83		37			
Camp Hall Traffic												
<b>2039 BUILD TRAFFIC VOLUMES</b>	<b>0</b>	<b>769</b>	<b>746</b>	<b>334</b>	<b>107</b>	<b>0</b>	<b>83</b>	<b>0</b>	<b>37</b>	<b>0</b>	<b>0</b>	<b>0</b>

# 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		121	83	37	783		745		335			
Camp Hall Traffic		106			40							
<b>2039 BUILD TRAFFIC VOLUMES</b>	<b>0</b>	<b>227</b>	<b>83</b>	<b>37</b>	<b>823</b>	<b>0</b>	<b>745</b>	<b>0</b>	<b>335</b>	<b>0</b>	<b>0</b>	<b>0</b>

## TRAFFIC VOLUME DEVELOPMENT

**I-26**

**DATE COUNTED: Wednesday, November 5, 2014**

INGRESS PEAK HOUR (5:30-6:30 AM*)	SC 27 to Volvo Car Drive		Volvo Car Drive To Jedburg Road	
	EB	WB	EB	WB
<b>2014 TRAFFIC VOLUMES</b>	<b>1,218</b>	<b>933</b>	<b>1,218</b>	<b>933</b>
<b>2015 TRAFFIC VOLUMES</b>	<b>1,242</b>	<b>952</b>	<b>1,242</b>	<b>952</b>
Years to Design Year (2039)	24	24	24	24
Yearly Growth Rate	2.0%	2.0%	2.0%	2.0%
Background Traffic Growth	596	457	596	457
Volvo Traffic	272	99	163	1,315
Camp Hall Traffic	0	0	0	0
<b>2039 BUILD TRAFFIC VOLUMES</b>	<b>2,110</b>	<b>1,508</b>	<b>2,001</b>	<b>2,724</b>

\*I-26 freeway volumes are developed using 2014 volumes for the hour of 6:00-7:00 AM.

**I-26 & Volvo Car Drive – Supplemental Analyses**

**Attachment C**

**Opening-Year 2019 Peak Ingress Hour  
Freeway and Weaving Analyses Worksheets**

Phone: Fax:  
E-mail:

---

Operational Analysis

---

Analyst: ae  
Agency or Company: Stantec  
Date Performed: 8/16/2016  
Analysis Time Period: 5:30 - 6:30 AM  
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	1489	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	414	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	910	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	910	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	2	
Density, D	12.1	pc/mi/ln
Level of service, LOS	B	

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

Phone: Fax:  
E-mail:

---

Operational Analysis

---

Analyst: ae  
Agency or Company: Stantec  
Date Performed: 8/16/2016  
Analysis Time Period: 5:30 - 6:30 AM  
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	1489	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	414	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	607	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	607	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	8.1	pc/mi/ln
Level of service, LOS	A	

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

Phone: Fax:  
E-mail:

-----Operational Analysis-----

Analyst: ae  
Agency or Company: Stantec  
Date Performed: 8/16/2016  
Analysis Time Period: 5:30 - 6:30 AM  
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	1353	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	376	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	827	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	827	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	2	
Density, D	11.0+	pc/mi/ln
Level of service, LOS	B	

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

Phone: Fax:  
E-mail:

-----Operational Analysis-----

Analyst: ae  
Agency or Company: Stantec  
Date Performed: 8/16/2016  
Analysis Time Period: 5:30 - 6:30 AM  
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	1433	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	398	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	438	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	438	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	5.8	pc/mi/ln
Level of service, LOS	A	

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

Phone: Fax:  
E-mail:

-----Operational Analysis-----

Analyst: ae  
Agency or Company: Stantec  
Date Performed: 8/16/2016  
Analysis Time Period: 5:30 - 6:30 AM  
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	1433	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	398	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	584	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	584	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	7.8	pc/mi/ln
Level of service, LOS	A	

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

Phone: Fax:  
E-mail:

-----Operational Analysis-----

Analyst: ae  
Agency or Company: Stantec  
Date Performed: 8/16/2016  
Analysis Time Period: 5:30 - 6:30 AM  
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	1433	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	398	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	876	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	876	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	2	
Density, D	11.7	pc/mi/ln
Level of service, LOS	B	

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

Phone: Fax:  
E-mail:

-----Operational Analysis-----

Analyst: ae  
Agency or Company: Stantec  
Date Performed: 8/16/2016  
Analysis Time Period: 5:30 - 6:30 AM  
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	1732	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	481	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	1058	pc/h/ln

-----Speed Inputs and Adjustments-----

Lane width	12.0	ft
Right-side lateral clearance	6.0	ft
Total ramp density, TRD	0.83	ramps/mi
Number of lanes, N	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	1058	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	2	
Density, D	14.1	pc/mi/ln
Level of service, LOS	B	

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

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_  
 E-mail: \_\_\_\_\_

-----Operational Analysis-----

Analyst: ae  
 Agency or Company: Stantec  
 Date Performed: 8/16/2016  
 Analysis Time Period: 5:30 - 6:30 AM  
 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	1732	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	481	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	706	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	706	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	9.4	pc/mi/ln
Level of service, LOS	A	

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

Phone: Fax:  
E-mail:

-----Operational Analysis-----

Analyst: ae  
Agency or Company: Stantec  
Date Performed: 8/16/2016  
Analysis Time Period: 5:30 - 6:30 AM  
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	1732	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	481	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	529	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	529	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	7.1	pc/mi/ln
Level of service, LOS	A	

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

Phone: Fax:  
E-mail:

-----Operational Analysis-----

Analyst: ae  
Agency or Company: Stantec  
Date Performed: 8/16/2016  
Analysis Time Period: 5:30 - 6:30 AM  
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	1080	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	300	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	660	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	660	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	2	
Density, D	8.8	pc/mi/ln
Level of service, LOS	A	

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

Phone: Fax:  
E-mail:

-----Operational Analysis-----

Analyst: ae  
Agency or Company: Stantec  
Date Performed: 8/16/2016  
Analysis Time Period: 5:30 - 6:30 AM  
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	1096	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	304	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	447	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	447	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	6.0	pc/mi/ln
Level of service, LOS	A	

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

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_  
 E-mail: \_\_\_\_\_

----- Operational Analysis -----

Analyst: ae  
 Agency or Company: Stantec  
 Date Performed: 8/16/2016  
 Analysis Time Period: 5:30 - 6:30 AM  
 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	1096	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	304	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	670	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	670	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	2	
Density, D	8.9	pc/mi/ln
Level of service, LOS	A	

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

Phone:  
E-mail:

Fax:

---

Operational Analysis

---

Analyst: ae  
 Agency/Co.: Stantec  
 Date Performed: 8/15/2016  
 Analysis Time Period: 5:30-6:30AM  
 Freeway/Dir of Travel: Volvo Car Drive/Northbound  
 Weaving Location: I-26 to Factory Entrance  
 Analysis Year: 2019  
 Description: I-26 & Volvo Car Drive Interchange

---

Inputs

---

Segment Type	C-D Roadway/ Multilane Highways	
Weaving configuration	Two-Sided	
Number of lanes, N	3	ln
Weaving segment length, LS	3110	ft
Freeway free-flow speed, FFS	45	mi/h
Minimum segment speed, SMIN	15	mi/h
Freeway maximum capacity, cIFL	2250	pc/h/ln
Terrain type	Level	
Grade	0.00	%
Length	0.00	mi

---

Conversion to pc/h Under Base Conditions

---

	Volume Components				veh/h
	VFF	VRF	VFR	VRR	
Volume, V	139	28	513	108	
Peak hour factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min volume, v15	39	8	143	30	
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	170	34	627	132	pc/h
Volume ratio, VR					0.137

---

Configuration Characteristics

---

Number of maneuver lanes, NWL	0	ln
Interchange density, ID	0.0	int/mi
Minimum RF lane changes, LCRF	0	lc/pc
Minimum FR lane changes, LCFR	0	lc/pc
Minimum RR lane changes, LCRR	3	lc/pc
Minimum weaving lane changes, LCMIN	396	lc/h
Weaving lane changes, LCW	582	lc/h
Non-weaving vehicle index, INW	0	
Non-weaving lane change, LCNW	1279	lc/h
Total lane changes, LCALL	1861	lc/h

---

Weaving and Non-Weaving Speeds

---

Weaving intensity factor, W	0.151
-----------------------------	-------

Average weaving speed, SW	41.1	mi/h
Average non-weaving speed, SNW	40.6	mi/h

\_\_\_\_\_Weaving Segment Speed, Density, Level of Service and Capacity\_\_\_\_\_

Weaving segment speed, S	40.7	mi/h
Weaving segment density, D	7.9	pc/mi/ln
Level of service, LOS	A	
Weaving segment v/c ratio	0.165	
Weaving segment flow rate, v	876	veh/h
Weaving segment capacity, cW	5318	veh/h

\_\_\_\_\_Limitations on Weaving Segments\_\_\_\_\_

If limit reached, see note.

	Minimum	Maximum	Actual	Note
Weaving length (ft)	300	7035	3110	a,b
Density-based capacity, cIWL (pc/h/ln)		2250	1950	c
v/c ratio		1.00	0.165	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.

\_\_\_\_\_

**I-26 & Volvo Car Drive – Supplemental Analyses**

**Attachment D**

**Opening-Year 2019 Design Hour**

**Freeway and Weaving Analyses 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: 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:

---

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:  
E-mail:

Fax:

---

Operational Analysis

---

Analyst: ae  
 Agency/Co.: Stantec  
 Date Performed: 8/16/2016  
 Analysis Time Period: 3:00-4:00 PM  
 Freeway/Dir of Travel: Volvo Car Drive/Northbound  
 Weaving Location: I-26 to Factory Entrance  
 Analysis Year: 2019  
 Description: I-26 & Volvo Car Drive Interchange

---

Inputs

---

Segment Type	C-D Roadway/ Multilane Highways	
Weaving configuration	Two-Sided	
Number of lanes, N	3	ln
Weaving segment length, LS	3110	ft
Freeway free-flow speed, FFS	45	mi/h
Minimum segment speed, SMIN	15	mi/h
Freeway maximum capacity, cIFL	2250	pc/h/ln
Terrain type	Level	
Grade	0.00	%
Length	0.00	mi

---

Conversion to pc/h Under Base Conditions

---

	Volume Components				veh/h
	VFF	VRF	VFR	VRR	
Volume, V	30	4	57	12	
Peak hour factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min volume, v15	8	1	16	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	37	5	70	15	pc/h
Volume ratio, VR					0.118

---

Configuration Characteristics

---

Number of maneuver lanes, NWL	0	ln
Interchange density, ID	0.0	int/mi
Minimum RF lane changes, LCRF	0	lc/pc
Minimum FR lane changes, LCFR	0	lc/pc
Minimum RR lane changes, LCRR	3	lc/pc
Minimum weaving lane changes, LCMIN	45	lc/h
Weaving lane changes, LCW	231	lc/h
Non-weaving vehicle index, INW	0	
Non-weaving lane change, LCNW	1131	lc/h
Total lane changes, LCALL	1362	lc/h

---

Weaving and Non-Weaving Speeds

---

Weaving intensity factor, W	0.118
-----------------------------	-------

Average weaving speed, SW	41.8	mi/h
Average non-weaving speed, SNW	44.5	mi/h

\_\_\_\_\_Weaving Segment Speed, Density, Level of Service and Capacity\_\_\_\_\_

Weaving segment speed, S	44.1	mi/h
Weaving segment density, D	1.0+	pc/mi/ln
Level of service, LOS	A	
Weaving segment v/c ratio	0.021	
Weaving segment flow rate, v	115	veh/h
Weaving segment capacity, cW	5356	veh/h

\_\_\_\_\_Limitations on Weaving Segments\_\_\_\_\_

If limit reached, see note.

	Minimum	Maximum	Actual	Note
Weaving length (ft)	300	6848	3110	a,b
Density-based capacity, cIWL (pc/h/ln)		2250	1964	c
v/c ratio		1.00	0.021	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.
-

**I-26 & Volvo Car Drive – Supplemental Analyses**

**Attachment E**

**Attachment E - Horizon-Year 2039 Peak Ingress Hour  
Freeway and Weaving Analyses Worksheets**

Phone: Fax:  
E-mail:

-----Operational Analysis-----

Analyst: ae  
Agency or Company: Stantec  
Date Performed: 8/16/2016  
Analysis Time Period: 5:30 - 6:30 AM  
Freeway/Direction: I-26 Eastbound  
From/To: SC 27 to New Interchange  
Jurisdiction: SCDOT  
Analysis Year: 2039 Design Year  
Description: 171001612 - Build

-----Flow Inputs and Adjustments-----

Volume, V	2110	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	586	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	860	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	860	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	11.5	pc/mi/ln
Level of service, LOS	B	

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

Phone: Fax:  
E-mail:

-----Operational Analysis-----

Analyst: ae  
Agency or Company: Stantec  
Date Performed: 8/16/2016  
Analysis Time Period: 5:30 - 6:30 AM  
Freeway/Direction: I-26 Eastbound  
From/To: New Interchange Off-Ramp Area  
Jurisdiction: SCDOT  
Analysis Year: 2039 Design Year  
Description: 171001612 - Build

-----Flow Inputs and Adjustments-----

Volume, V	2110	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	586	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	645	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	645	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	8.6	pc/mi/ln
Level of service, LOS	A	

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

Phone: Fax:  
E-mail:

-----Operational Analysis-----

Analyst: ae  
Agency or Company: Stantec  
Date Performed: 8/16/2016  
Analysis Time Period: 5:30 - 6:30 AM  
Freeway/Direction: I-26 Eastbound  
From/To: New Interchange  
Jurisdiction: SCDOT  
Analysis Year: 2039 Design Year  
Description: 171001612 - Build

-----Flow Inputs and Adjustments-----

Volume, V	1845	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	513	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	752	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	752	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	10.0	pc/mi/ln
Level of service, LOS	A	

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

Phone: Fax:  
E-mail:

-----Operational Analysis-----

Analyst: ae  
Agency or Company: Stantec  
Date Performed: 8/16/2016  
Analysis Time Period: 5:30 - 6:30 AM  
Freeway/Direction: I-26 Eastbound  
From/To: New Interchange 2 On Ramp  
Jurisdiction: SCDOT  
Analysis Year: 2039 Design Year  
Description: 171001612 - Build

-----Flow Inputs and Adjustments-----

Volume, V	2001	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	556	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	489	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	489	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	5	
Density, D	6.5	pc/mi/ln
Level of service, LOS	A	

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

Phone: Fax:  
E-mail:

-----Operational Analysis-----

Analyst: ae  
Agency or Company: Stantec  
Date Performed: 8/16/2016  
Analysis Time Period: 5:30 - 6:30 AM  
Freeway/Direction: I-26 Eastbound  
From/To: New Interchange 1 On Ramp  
Jurisdiction: SCDOT  
Analysis Year: 2039 Design Year  
Description: 171001612 - Build

-----Flow Inputs and Adjustments-----

Volume, V	2001	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	556	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	611	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	611	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	8.1	pc/mi/ln
Level of service, LOS	A	

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

Phone: Fax:  
E-mail:

-----Operational Analysis-----

Analyst: ae  
Agency or Company: Stantec  
Date Performed: 8/16/2016  
Analysis Time Period: 5:30 - 6:30 AM  
Freeway/Direction: I-26 Eastbound  
From/To: New Interchange to Jedburg  
Jurisdiction: SCDOT  
Analysis Year: 2039 Design Year  
Description: 171001612 - Build

-----Flow Inputs and Adjustments-----

Volume, V	2001	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	556	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	815	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	815	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	10.9	pc/mi/ln
Level of service, LOS	A	

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

Phone: Fax:  
E-mail:

-----Operational Analysis-----

Analyst: ae  
Agency or Company: Stantec  
Date Performed: 8/16/2016  
Analysis Time Period: 5:30 - 6:30 AM  
Freeway/Direction: I-26 Westbound  
From/To: Jedburg to New Interchange  
Jurisdiction: SCDOT  
Analysis Year: 2039 Design Year  
Description: 171001612 - Build

-----Flow Inputs and Adjustments-----

Volume, V	2724	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	757	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	1110	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	1110	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	14.8	pc/mi/ln
Level of service, LOS	B	

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

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_  
 E-mail: \_\_\_\_\_

----- Operational Analysis -----

Analyst: ae  
 Agency or Company: Stantec  
 Date Performed: 8/16/2016  
 Analysis Time Period: 5:30 - 6:30 AM  
 Freeway/Direction: I-26 Westbound  
 From/To: New Interchange 1 Off Ramp  
 Jurisdiction: SCDOT  
 Analysis Year: 2039 Design Year  
 Description: 171001612 - Build

----- Flow Inputs and Adjustments -----

Volume, V	2724	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	757	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	832	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	832	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	11.1	pc/mi/ln
Level of service, LOS	B	

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

Phone: Fax:  
E-mail:

-----Operational Analysis-----

Analyst: ae  
Agency or Company: Stantec  
Date Performed: 8/16/2016  
Analysis Time Period: 5:30 - 6:30 AM  
Freeway/Direction: I-26 Westbound  
From/To: New Interchange 2 Off Ramp  
Jurisdiction: SCDOT  
Analysis Year: 2039 Design Year  
Description: 171001612 - Build

-----Flow Inputs and Adjustments-----

Volume, V	2724	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	757	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	666	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	666	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	8.9	pc/mi/ln
Level of service, LOS	A	

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

Phone: Fax:  
E-mail:

-----Operational Analysis-----

Analyst: ae  
Agency or Company: Stantec  
Date Performed: 8/16/2016  
Analysis Time Period: 5:30 - 6:30 AM  
Freeway/Direction: I-26 Westbound  
From/To: New Interchange  
Jurisdiction: SCDOT  
Analysis Year: 2039 Design Year  
Description: 171001612 - Build

-----Flow Inputs and Adjustments-----

Volume, V	1474	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	409	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	601	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	601	pc/h/ln
Free-flow speed, FFS	72.6	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	8.0	pc/mi/ln
Level of service, LOS	A	

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

Phone: Fax:  
E-mail:

-----Operational Analysis-----

Analyst: ae  
Agency or Company: Stantec  
Date Performed: 8/16/2016  
Analysis Time Period: 5:30 - 6:30 AM  
Freeway/Direction: I-26 Westbound  
From/To: New Interchange On Ramp  
Jurisdiction: SCDOT  
Analysis Year: 2039 Design Year  
Description: 171001612 - Build

-----Flow Inputs and Adjustments-----

Volume, V	1508	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	419	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	461	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	461	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	6.1	pc/mi/ln
Level of service, LOS	A	

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

Phone: Fax:  
E-mail:

-----Operational Analysis-----

Analyst: ae  
Agency or Company: Stantec  
Date Performed: 8/16/2016  
Analysis Time Period: 5:30 - 6:30 AM  
Freeway/Direction: I-26 Westbound  
From/To: New Interchange to SC 27  
Jurisdiction: SCDOT  
Analysis Year: 2039 Design Year  
Description: 171001612 - Build

-----Flow Inputs and Adjustments-----

Volume, V	1508	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	419	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	614	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	614	pc/h/ln
Free-flow speed, FFS	73.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	3	
Density, D	8.2	pc/mi/ln
Level of service, LOS	A	

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

Phone:  
E-mail:

Fax:

---

Operational Analysis

---

Analyst: ae  
 Agency/Co.: Stantec  
 Date Performed: 8/15/2016  
 Analysis Time Period: 5:30-6:30AM  
 Freeway/Dir of Travel: Volvo Car Drive/Northbound  
 Weaving Location: I-26 to Factory Entrance  
 Analysis Year: 2039  
 Description: I-26 & Volvo Car Drive Interchange

---

Inputs

---

Segment Type	C-D Roadway/ Multilane Highways	
Weaving configuration	Two-Sided	
Number of lanes, N	3	ln
Weaving segment length, LS	3110	ft
Freeway free-flow speed, FFS	45	mi/h
Minimum segment speed, SMIN	15	mi/h
Freeway maximum capacity, cIFL	2250	pc/h/ln
Terrain type	Level	
Grade	0.00	%
Length	0.00	mi

---

Conversion to pc/h Under Base Conditions

---

	Volume Components				veh/h
	VFF	VRF	VFR	VRR	
Volume, V	634	135	616	130	
Peak hour factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min volume, v15	176	38	171	36	
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	775	165	753	159	pc/h
Volume ratio, VR					0.086

---

Configuration Characteristics

---

Number of maneuver lanes, NWL	0	ln
Interchange density, ID	0.0	int/mi
Minimum RF lane changes, LCRF	0	lc/pc
Minimum FR lane changes, LCFR	0	lc/pc
Minimum RR lane changes, LCRR	3	lc/pc
Minimum weaving lane changes, LCMIN	477	lc/h
Weaving lane changes, LCW	663	lc/h
Non-weaving vehicle index, INW	0	
Non-weaving lane change, LCNW	1457	lc/h
Total lane changes, LCALL	2120	lc/h

---

Weaving and Non-Weaving Speeds

---

Weaving intensity factor, W	0.167
-----------------------------	-------

Average weaving speed, SW	40.7	mi/h
Average non-weaving speed, SNW	38.6	mi/h

\_\_\_\_\_Weaving Segment Speed, Density, Level of Service and Capacity\_\_\_\_\_

Weaving segment speed, S	38.8	mi/h
Weaving segment density, D	15.9	pc/mi/ln
Level of service, LOS	B	
Weaving segment v/c ratio	0.310	
Weaving segment flow rate, v	1684	veh/h
Weaving segment capacity, cW	5422	veh/h

\_\_\_\_\_Limitations on Weaving Segments\_\_\_\_\_

If limit reached, see note.

	Minimum	Maximum	Actual	Note
Weaving length (ft)	300	6535	3110	a,b
Density-based capacity, cIWL (pc/h/ln)		2250	1988	c
v/c ratio		1.00	0.310	d

Notes:

- In weaving segments shorter than 300 ft, weaving vehicles are assumed to make only necessary lane changes.
- 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."
- The density-based capacity exceeds the capacity of a basic freeway segment, under equivalent ideal conditions.
- Volumes exceed the weaving segment capacity. The level of service is F.

\_\_\_\_\_

**I-26 & Volvo Car Drive – Supplemental Analyses**

**Attachment F**

**Horizon-Year 2039 Design Hour**

**Freeway and Weaving Analyses 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: 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	

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:  
E-mail:

Fax:

---

Operational Analysis

---

Analyst: ae  
 Agency/Co.: Stantec  
 Date Performed: 8/16/2016  
 Analysis Time Period: 3:00 - 4:00 PM  
 Freeway/Dir of Travel: Volvo Car Drive/Northbound  
 Weaving Location: I-26 to Factory Entrance  
 Analysis Year: 2039  
 Description: I-26 & Volvo Car Drive Interchange

---

Inputs

---

Segment Type	C-D Roadway/ Multilane Highways	
Weaving configuration	Two-Sided	
Number of lanes, N	3	ln
Weaving segment length, LS	3110	ft
Freeway free-flow speed, FFS	45	mi/h
Minimum segment speed, SMIN	15	mi/h
Freeway maximum capacity, cIFL	2250	pc/h/ln
Terrain type	Level	
Grade	0.00	%
Length	0.00	mi

---

Conversion to pc/h Under Base Conditions

---

	Volume Components				veh/h
	VFF	VRF	VFR	VRR	
Volume, V	192	35	68	15	
Peak hour factor, PHF	0.90	0.90	0.90	0.90	
Peak 15-min volume, v15	53	10	19	4	
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	235	43	83	18	pc/h
Volume ratio, VR					0.047

---

Configuration Characteristics

---

Number of maneuver lanes, NWL	0	ln
Interchange density, ID	0.0	int/mi
Minimum RF lane changes, LCRF	0	lc/pc
Minimum FR lane changes, LCFR	0	lc/pc
Minimum RR lane changes, LCRR	3	lc/pc
Minimum weaving lane changes, LCMIN	54	lc/h
Weaving lane changes, LCW	240	lc/h
Non-weaving vehicle index, INW	0	
Non-weaving lane change, LCNW	1182	lc/h
Total lane changes, LCALL	1422	lc/h

---

Weaving and Non-Weaving Speeds

---

Weaving intensity factor, W	0.122
-----------------------------	-------

Average weaving speed, SW	41.7	mi/h
Average non-weaving speed, SNW	44.0	mi/h

\_\_\_\_\_Weaving Segment Speed, Density, Level of Service and Capacity\_\_\_\_\_

Weaving segment speed, S	43.9	mi/h
Weaving segment density, D	2.9+	pc/mi/ln
Level of service, LOS	A	
Weaving segment v/c ratio	0.063	
Weaving segment flow rate, v	345	veh/h
Weaving segment capacity, cW	5498	veh/h

\_\_\_\_\_Limitations on Weaving Segments\_\_\_\_\_

If limit reached, see note.

	Minimum	Maximum	Actual	Note
Weaving length (ft)	300	6169	3110	a,b
Density-based capacity, cIWL (pc/h/ln)		2250	2016	c
v/c ratio		1.00	0.063	d

Notes:

- In weaving segments shorter than 300 ft, weaving vehicles are assumed to make only necessary lane changes.
- 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."
- The density-based capacity exceeds the capacity of a basic freeway segment, under equivalent ideal conditions.
- Volumes exceed the weaving segment capacity. The level of service is F.

\_\_\_\_\_