AECOM

INTERCHANGE MODIFICATION REPORT ADDENDUM

I-26 AT S-48 (COLUMBIA AVENUE) INTERCHANGE IMPROVEMENTS

LEXINGTON COUNTY, SOUTH CAROLINA
PROJECT NO. R4035500-121734.01
PROJECT ID P042383

MARCH 2018

PREPARED FOR:
SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION
&
LEXINGTON COUNTY

SCDOT
South Carolina Department of Transportation

Lexington County South Carolina

AECOM

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7-26-18

SCDOT
South Carolina Department of Transportation

AECOM submitted the I-26 at S-48 (Columbia Avenue) Interchange Modification Report (IMR) on December 16, 2016 that addressed comments from SCDOT. Since this submittal date, the Federal Highway Administration (FHWA) has found some inconsistencies in the heavy vehicle percentage used on Interstate 26 between the multiple firms performing traffic studies along this corridor. To provide a consistent analysis, it was recommended for AECOM to update is traffic analysis using the latest available heavy vehicle percentages during the AM and PM peak hours. The following heavy percentages were used in the revised analysis along I-26:

- Eastbound I-26 AM Peak – 16%
- Eastbound I-26 PM Peak – 14%
- Westbound I-26 AM Peak – 23%
- Westbound I-26 PM Peak – 13%

To ease the review process for FHWA, the same table numbers, figure numbers, and appendices were used so this addendum can be directly compared with the December 16, 2016 original IMR.

Existing 2014 HCS Analysis

The results of the Existing 2014 revised Freeway / Merge / Diverge analysis using Highway Capacity Software (HCS) 2010 indicate:

- East of Exit 97 (US 176), I-26 is operating at LOS E in the AM peak hour (eastbound) and LOS D during the PM peak hour (westbound)
- Eastbound merge from Exit 97 (US 176) onto I-26 is operating at LOS D in the AM peak hour
- Westbound diverge from I-26 onto Exit 97 (US 176) is operating at LOS D in the PM peak hour

All other freeway segment / merge / diverge analyses are operating at LOS C or better.

Table 6 summarizes the LOS and density for each merge / diverge area with detailed HCS reports found in Appendix E.

Table 6: Existing 2014 Freeway / Merge / Diverge LOS and Density

Approach	Description	HCM 2010 Level of Service (LOS)		Density (pc/mi/ln)	
		AM	PM	AM	PM
Freeway Segment					
Eastbound	West of Exit 85	B	B	11.0	12.9
	Between Exit 85 and Exit 91	B	B	12.4	12.6
	Between Exit 91 and Exit 97	C	B	18.6	16.3
	East of Exit 97	E	C	40.2	22.8
Westbound	East of Exit 97	B	D	14.7	31.9
	Between Exit 91 and Exit 97	B	B	11.9	16.7
	Between Exit 85 and Exit 91	A	B	8.5	11.3
	West of Exit 85	A	B	8.9	10.8
Merge Area					
Eastbound	EB Exit 85 On-Ramp	B	B	17.0	17.6
	EB Exit 91 On-Ramp	B	B	15.6	13.9
	EB Exit 97 On-Ramp	D	B	28.3	19.6
Westbound	WB Exit 97 On-Ramp	A	B	9.9	15.6
	WB Exit 91 On-Ramp	A	B	7.4	10.7
	WB Exit 85 On-Ramp	B	B	12.4	14.7
Diverge Area					
Eastbound	EB Exit 85 Off-Ramp	B	B	14.9	17.3
	EB Exit 91 Off-Ramp	B	B	11.5	11.7
	EB Exit 97 Off-Ramp	B	B	18.7	16.1
Westbound	WB Exit 97 Off-Ramp	B	D	12.2	28.0
	WB Exit 91 Off-Ramp	A	B	8.6	14.6
	WB Exit 85 Off-Ramp	B	B	11.6	15.2

Figure 10 shows the LOS for the Existing 2014 conditions.

No-Build 2020 HCS Analysis

The results of the No-Build 2020 revised Freeway / Merge / Diverge analysis using Highway Capacity Software (HCS) 2010 indicate:

- East of Exit 97 (US 176), I-26 is expected to operate at LOS F in the AM peak hour (eastbound) the PM peak hour (westbound)
- Eastbound merge from Exit 97 (US 176) onto I-26 is expected to operate at LOS F in the AM peak hour
- Westbound diverge from I-26 onto Exit 97 (US 176) is expected to operate at LOS F in the PM peak hour

All other freeway segment / merge / diverge analyses are operating at LOS C or better.

Table 8 summarizes the LOS and density for each merge / diverge area with detailed HCS reports found in Appendix G.

Table 8: No-Build 2020 Freeway / Merge / Diverge LOS and Density

Approach	Description	HCM 2010 Level of Service (LOS)		Density (pc/mi/ln)	
		AM	PM	AM	PM
Freeway Segment					
Eastbound	West of Exit 85	B	B	12.7	15.4
	Between Exit 85 and Exit 91	B	B	14.2	15.1
	Between Exit 91 and Exit 97	C	C	24.5	24.0
	East of Exit 97	F	D	62.2	34.5
Westbound	East of Exit 97	C	F	20.9	50.8
	Between Exit 91 and Exit 97	B	C	17.3	23.9
	Between Exit 85 and Exit 91	A	B	10.0	13.4
	West of Exit 85	A	B	10.4	12.9
Merge Area					
Eastbound	EB Exit 85 On-Ramp	B	C	19.1	20.5
	EB Exit 91 On-Ramp	C	C	20.1	20.2
	EB Exit 97 On-Ramp	F	C	34.4	27.2
Westbound	WB Exit 97 On-Ramp	B	C	15.9	22.4
	WB Exit 91 On-Ramp	A	B	9.0	13.1
	WB Exit 85 On-Ramp	B	B	14.2	17.2
Diverge Area					
Eastbound	EB Exit 85 Off-Ramp	B	C	17.1	20.5
	EB Exit 91 Off-Ramp	B	B	13.8	14.9
	EB Exit 97 Off-Ramp	C	C	24.6	24.1
Westbound	WB Exit 97 Off-Ramp	B	F	19.1	36.5
	WB Exit 91 Off-Ramp	B	C	15.2	22.0
	WB Exit 85 Off-Ramp	B	B	13.6	18.0

Figure 11 shows the LOS for the No-Build 2020 conditions.

No-Build 2040 HCS Analysis

The results of the No-Build 2040 revised Freeway / Merge / Diverge analysis using Highway Capacity Software (HCS) 2010 indicate

- East of Exit 97 (US 176), I-26 is expected to continue to operate at LOS F in the AM peak hour (eastbound) the PM peak hour (westbound)
- Between Exit 97 (US 176) to Exit 91 (S-48) is expected to operate at LOS E in the AM peak hour (eastbound) the PM peak hour (westbound)
- Eastbound merge from Exit 97 (US 176) onto I-26 is expected to continue to operate at LOS F during the AM and PM peak hours
- Westbound merge from Exit 97 (US 176) to I-26 is expected to operate at LOS D in the PM peak hour
- Eastbound merge from Exit 91 (S-48) onto I-26 is expected to operate at LOS D during the AM and PM peak hours

- Eastbound diverge from I-26 onto Exit 97 (US 176) is expected to operate at LOS E during the AM and PM peak hours
- Westbound diverge from I-26 onto Exit 97 (US 176) is expected to operate at LOS D in the AM peak hour and LOS F during the PM peak hour
- Westbound diverge from I-26 onto Exit 91 (S-48) is expected to operate at LOS D in the PM peak hour
- Westbound diverge from I-26 onto Exit 85 (SC 202) is expected to operate at LOS D during the PM peak hour, but only by 0.6 (pc/hr/ln)

All other freeway segment / merge / diverge analyses are operating at LOS C or better.

Table 10 summarizes the LOS and density for each merge / diverge area with detailed HCS reports found in Appendix I.

Table 10: No-Build 2040 Freeway / Merge / Diverge LOS and Density

Approach	Description	HCM 2010 Level of Service (LOS)		Density (pc/mi/ln)	
		AM	PM	AM	PM
Freeway Segment					
Eastbound	West of Exit 85	C	C	18.8	23.0
	Between Exit 85 and Exit 91	C	C	21.1	22.4
	Between Exit 91 and Exit 97	E	E	42.4	43.0
	East of Exit 97	F	F	1356.8	78.2
Westbound	East of Exit 97	D	F	33.6	230.4
	Between Exit 91 and Exit 97	D	E	26.7	40.9
	Between Exit 85 and Exit 91	B	C	14.1	19.7
	West of Exit 85	B	C	14.6	18.9
Merge Area					
Eastbound	EB Exit 85 On-Ramp	C	C	26.1	27.7
	EB Exit 91 On-Ramp	D	D	29.2	30.0
	EB Exit 97 On-Ramp	F	F	47.1	38.9
Westbound	WB Exit 97 On-Ramp	C	D	24.0	32.1
	WB Exit 91 On-Ramp	B	B	13.7	19.6
	WB Exit 85 On-Ramp	B	C	19.0	23.6
Diverge Area					
Eastbound	EB Exit 85 Off-Ramp	C	D	24.4	28.6
	EB Exit 91 Off-Ramp	C	C	21.6	22.9
	EB Exit 97 Off-Ramp	E	E	35.5	35.7
Westbound	WB Exit 97 Off-Ramp	D	F	29.1	50.6
	WB Exit 91 Off-Ramp	C	D	24.3	32.8
	WB Exit 85 Off-Ramp	B	C	18.8	25.3

Figure 12 shows the LOS for the 2040 No-Build Conditions

Build 2020 HCS Analysis

The Build 2020 analysis results are similar to the No-Build 2020 results except at Exit 91 (S-48) with the addition of Alternative 1 and Alternative 2 (includes a loop ramp). The results of the Build 2020 revised Freeway / Merge / Diverge analysis using Highway Capacity Software (HCS) 2010 indicate:

- East of Exit 97 (US 176), I-26 is expected to operate at LOS F in the AM peak hour (eastbound) the PM peak hour (westbound)
- Eastbound merge from Exit 97 (US 176) onto I-26 is expected to operate at LOS F in the AM peak hour
- Westbound diverge from I-26 onto Exit 97 (US 176) is expected to operate at LOS F in the PM peak hour

All other freeway segment / merge / diverge analyses are operating at LOS C or better including the various alternatives at Exit 91 (S-48).

Table 12 summarizes the LOS and density for each merge / diverge area with detailed HCS reports found in Appendix G.

Table 12: Build 2020 Freeway / Merge / Diverge LOS and Density

Approach	Description	HCM 2010 Level of Service (LOS)		Density (pc/mi/ln)	
		AM	PM	AM	PM
Freeway Segment					
Eastbound	West of Exit 85	B	B	12.7	15.4
	Between Exit 85 and Exit 91	B	B	14.2	15.1
	Between Exit 91 and Exit 97	C	C	24.5	24.0
	East of Exit 97	F	D	62.2	34.5
Westbound	East of Exit 97	C	F	20.9	50.8
	Between Exit 91 and Exit 97	B	C	17.3	23.9
	Between Exit 85 and Exit 91	A	B	10.0	13.4
	West of Exit 85	A	B	10.4	12.9
Merge Area					
Eastbound	EB Exit 85 On-Ramp	B	C	19.1	20.5
	EB Exit 91 On-Ramp	C	C	20.1	20.2
	EB Exit 97 On-Ramp	F	C	34.4	27.2
Westbound	WB Exit 97 On-Ramp	B	C	15.9	22.4
	WB Exit 91 On-Ramp	A	B	9.0	13.1
	WB Exit 85 On-Ramp	B	B	14.2	17.2
Diverge Area					
Eastbound	EB Exit 85 Off-Ramp	B	C	17.1	20.5
	EB Exit 91 Off-Ramp	B	B	13.8	14.9
	EB Exit 97 Off-Ramp	C	C	24.6	24.1
Westbound	WB Exit 97 Off-Ramp	B	F	19.1	36.5
	WB Exit 91 Off-Ramp – Alt 1	B	C	15.2	22.0
	WB Exit 91 Off-Ramp – Alt 2	B	C	15.2	22.0
	WB Exit 91 Off Loop Ramp – Alt 2	B	B	13.2	19.2
	WB Exit 85 Off-Ramp	B	B	13.6	18.0

Figure 13 and 14 shows the LOS for the 2020 Build Conditions for Alternative 1 and 2.

Build 2040 HCS Analysis

The Build 2040 analysis results are similar to the No-Build 2040 results except at Exit 91 (S-48) with the addition of Alternative 1 and Alternative 2 (includes a loop ramp). The results of the Build 2040 revised Freeway / Merge / Diverge analysis using Highway Capacity Software (HCS) 2010 indicate:

- East of Exit 97 (US 176), I-26 is expected to continue to operate at LOS F in the AM peak hour (eastbound) the PM peak hour (westbound)
- Between Exit 97 (US 176) to Exit 91 (S-48) is expected to operate at LOS E in the AM peak hour (eastbound) the PM peak hour (westbound)
- Eastbound merge from Exit 97 (US 176) onto I-26 is expected to continue to operate at LOS F during the AM and PM peak hours
- Westbound merge from Exit 97 (US 176) to I-26 is expected to operate at LOS D in the PM peak hour
- Eastbound merge from Exit 91 (S-48) onto I-26 is expected to operate at LOS D during the AM and PM peak hours
- Eastbound diverge from I-26 onto Exit 97 (US 176) is expected to operate at LOS E during the AM and PM peak hours
- Westbound diverge from I-26 onto Exit 97 (US 176) is expected to operate at LOS D in the AM peak hour and LOS F during the PM peak hour
- Westbound diverge from I-26 onto Exit 91 (S-48) is expected to operate at LOS D in the PM peak hour for Alternative 1
- Westbound diverge from I-26 onto Exit (S-48) is expected to operate at LOS D in the PM peak hour for Alternative 2
- Westbound diverge from I-26 onto Exit 85 (SC 202) is expected to operate at LOS D during the PM peak hour

All other freeway segment / merge / diverge analyses are operating at LOS C or better.

Table 14 summarizes the LOS and density for each merge / diverge area with detailed HCS reports found in Appendix I.

Table 14: Build 2040 Freeway / Merge / Diverge LOS and Density

Approach	Description	HCM 2010 Level of Service (LOS)		Density (pc/mi/ln)	
		AM	PM	AM	PM
Freeway Segment					
Eastbound	West of Exit 85	C	C	18.8	23.0
	Between Exit 85 and Exit 91	C	C	21.1	22.4
	Between Exit 91 and Exit 97	E	F	42.4	43.0
	East of Exit 97	F	F	1356.8	78.2
Westbound	East of Exit 97	D	F	33.6	230.4
	Between Exit 91 and Exit 97	D	E	26.7	40.9
	Between Exit 85 and Exit 91	B	C	14.1	19.7
	West of Exit 85	B	C	14.6	18.9
Merge Area					
Eastbound	EB Exit 85 On-Ramp	C	C	26.1	27.7
	EB Exit 91 On-Ramp	D	D	29.2	30.0
	EB Exit 97 On-Ramp	F	F	47.1	38.9
Westbound	WB Exit 97 On-Ramp	C	D	24.0	32.1
	WB Exit 91 On-Ramp	B	B	13.7	19.6
	WB Exit 85 On-Ramp	B	C	19.0	23.6
Diverge Area					
Eastbound	EB Exit 85 Off-Ramp	C	D	24.4	28.6
	EB Exit 91 Off-Ramp	C	C	21.6	22.9
	EB Exit 97 Off-Ramp	E	E	35.5	35.7
Westbound	WB Exit 97 Off-Ramp	D	F	29.1	50.6
	WB Exit 91 Off-Ramp – Alt 1	C	D	24.3	32.8
	WB Exit 91 Off-Ramp – Alt 2	B	A	15.2	8.4
	WB Exit 91 Off Loop Ramp – Alt 2	C	D	22.2	29.9
	WB Exit 85 Off-Ramp	B	C	18.8	25.3

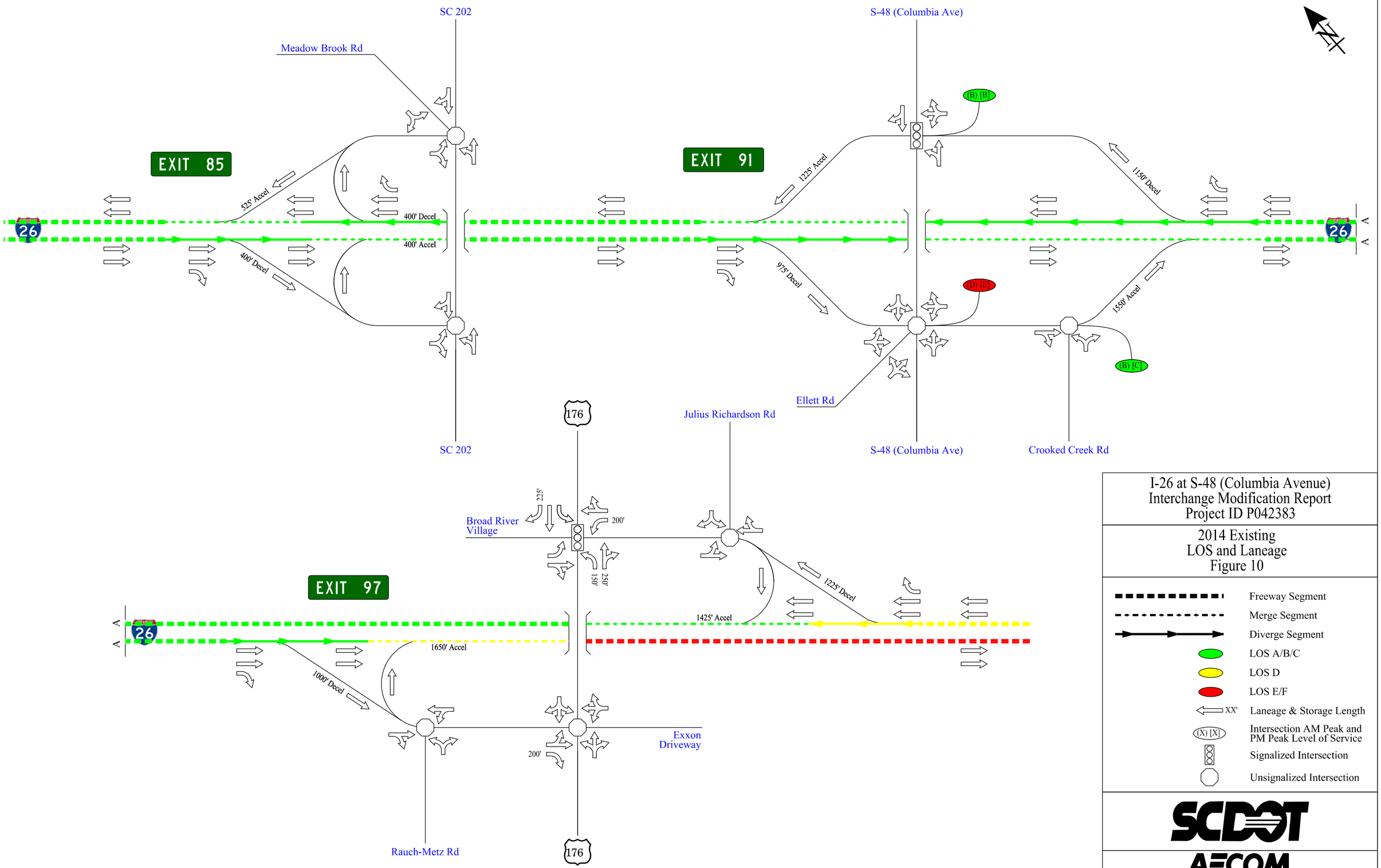
Figure 15 and 16 shows the LOS for the 2040 Build Conditions for Alternative 1 and 2.

Summary of Findings

Based on the revised traffic analysis that incorporates the latest heavy truck percentages along I-26, it can be concluded that the I-26 at S-48 interchange continues to operate at a LOS D or better for the freeway merge and diverge segments. As indicated in the original IMR dated 12-16-16, the operation around Exit 97 (US 176) continues to operate at LOS F in the 2020 design year with even greater densities by 2040.

One new finding as a result of the increased heavy vehicle percentages is the freeway segment operation between Exit 97 (US 176) and Exit 91 (S-48). Operation is expected to be LOS E instead of LOS D by the year 2040. Widening I-26 between Exit 91 (S-48) and Exit 85 (US 176) from a 4-lane freeway to a 6-lane freeway should be considered by the year 2040.

Finally, the original IMR dated 12-16-16 indicated that the Exit 85 interchange (SC 202) did not require any improvements. With the increased heavy percentages and revised analysis, the Exit 85 interchange (SC 202) continues to operate at a LOS D or better. While this interchange may not need improvements as a result of traffic volumes, this interchange may need to be replaced due to existing horizontal and vertical clearances with I-26.


SC 202
Meadow Brook Rd
EXIT 85
525' Accel
400' Decel
400' Accel
400' Decel
26
SC 202
S-48 (Columbia Ave)
EXIT 91
1225' Accel
1150' Decel
(B) [B]
975' Decel
(D) [E]
1550' Accel
(B) [C]
Ellett Rd
26
S-48 (Columbia Ave)
Julius Richardson Rd
Crooked Creek Rd
176
225'
Broad River Village
200'
150'
250'
EXIT 97
1225' Decel
1425' Accel
1650' Accel
1000' Decel
26
Exxon Driveway
200'
Rauch-Metz Rd
176
I-26 at S-48 (Columbia Avenue)
Interchange Modification Report
Project ID P042383
2014 Existing
LOS and Laneage
Figure 10
Freeway Segment
Merge Segment
Diverge Segment
LOS A/B/C
LOS D
LOS E/F
XX' Laneage & Storage Length
(X) [X] Intersection AM Peak and PM Peak Level of Service
Signalized Intersection
Unsignalized Intersection
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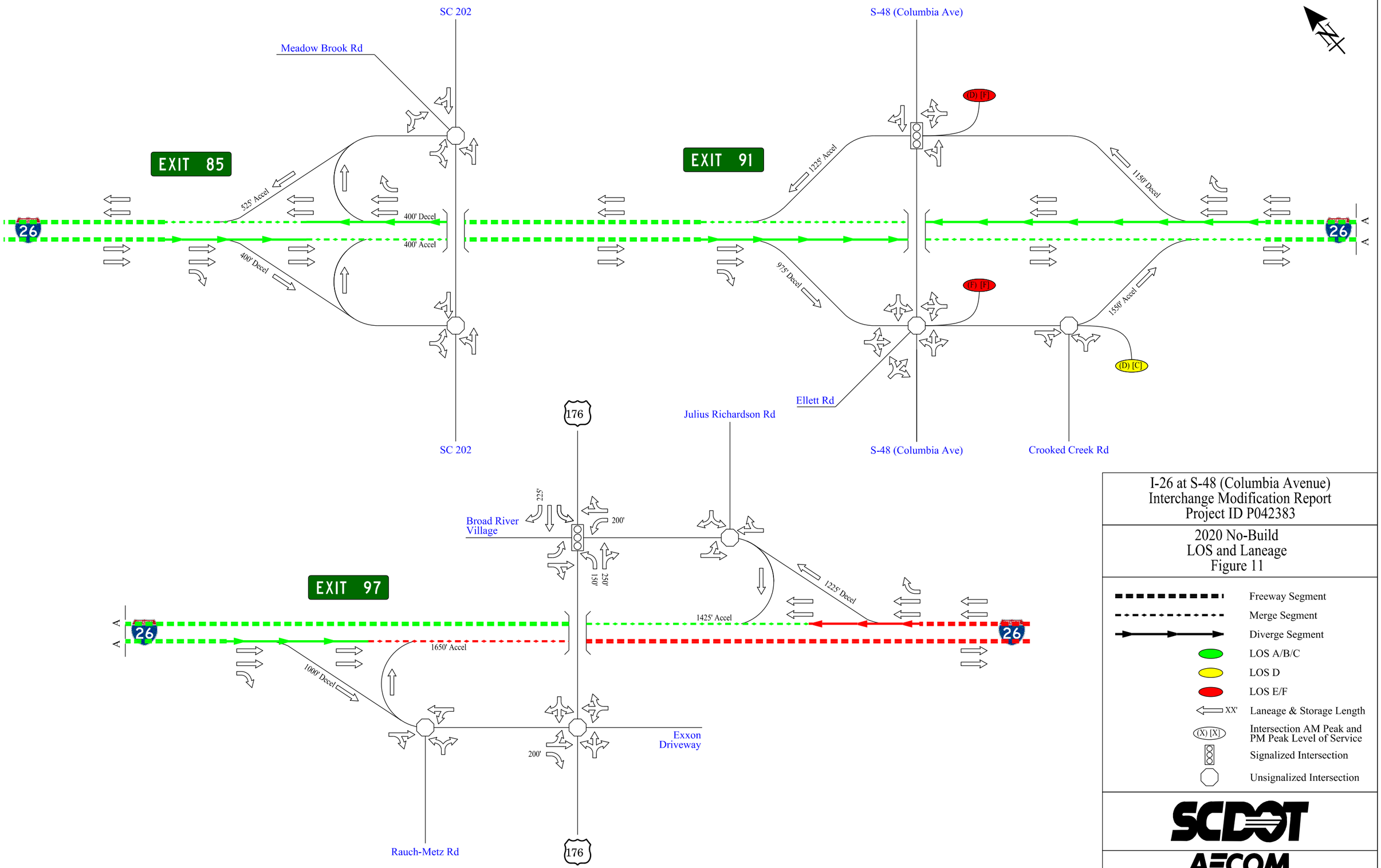

I-26 at S-48 (Columbia Avenue)
Interchange Modification Report
Project ID P042383

2020 No-Build
LOS and Laneage
Figure 11

- Freeway Segment
- Merge Segment
- Diverge Segment
- LOS A/B/C
- LOS D
- LOS E/F
- XX' Laneage & Storage Length
- (X) [X] Intersection AM Peak and PM Peak Level of Service
- Signalized Intersection
- Unsignalized Intersection

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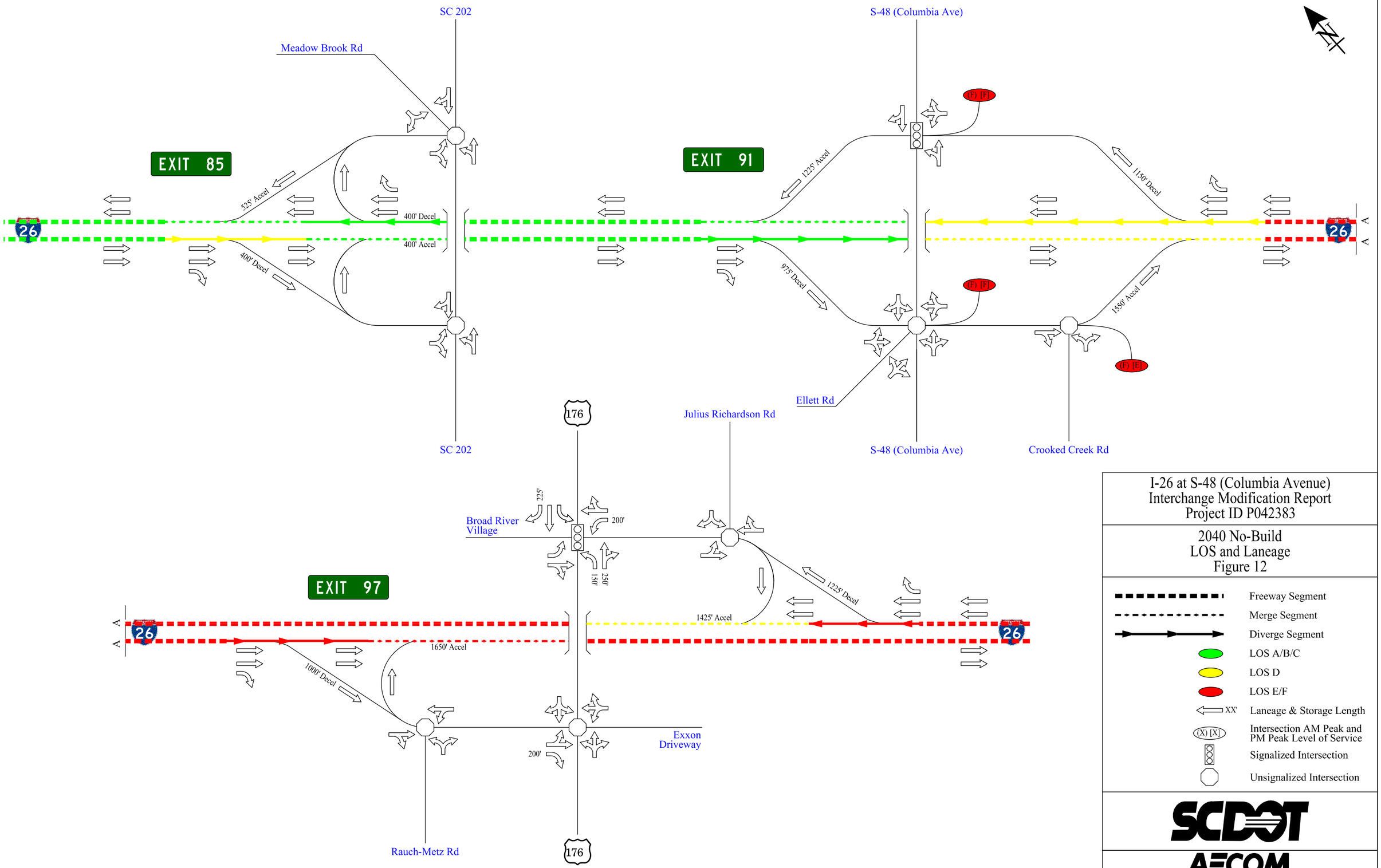

I-26 at S-48 (Columbia Avenue)
Interchange Modification Report
Project ID P042383

2040 No-Build
LOS and Laneage
Figure 12

- Freeway Segment
- Merge Segment
- Diverge Segment
- LOS A/B/C
- LOS D
- LOS E/F
- XX' Laneage & Storage Length
- (X) [X] Intersection AM Peak and PM Peak Level of Service
- Signalized Intersection
- Unsignalized Intersection

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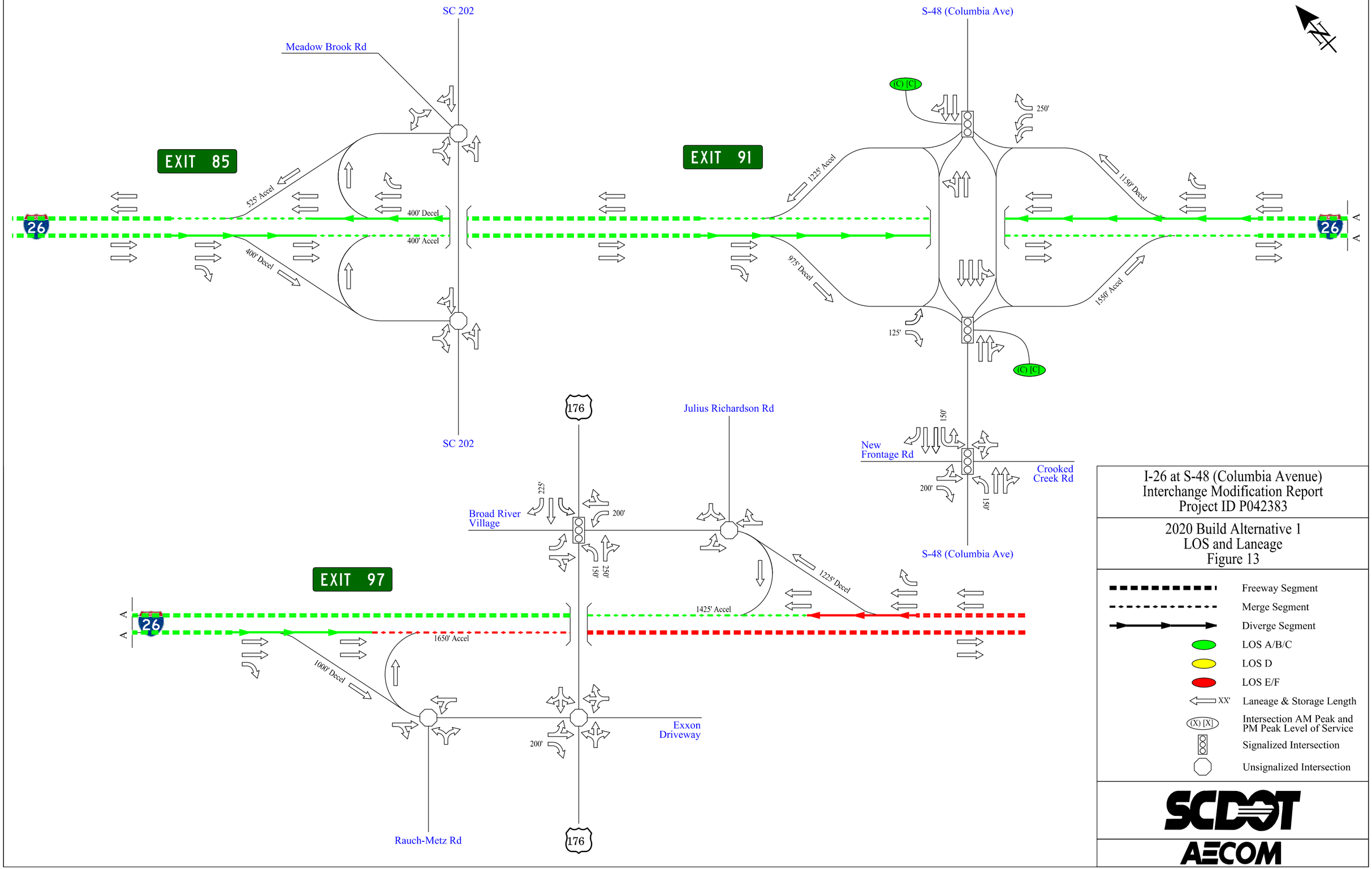

I-26 at S-48 (Columbia Avenue)
Interchange Modification Report
Project ID P042383

2020 Build Alternative 1
LOS and Laneage
Figure 13

- Freeway Segment
- Merge Segment
- Diverge Segment
- LOS A/B/C
- LOS D
- LOS E/F
- XX' Laneage & Storage Length
- (X) [X] Intersection AM Peak and PM Peak Level of Service
- Signalized Intersection
- Unsignalized Intersection

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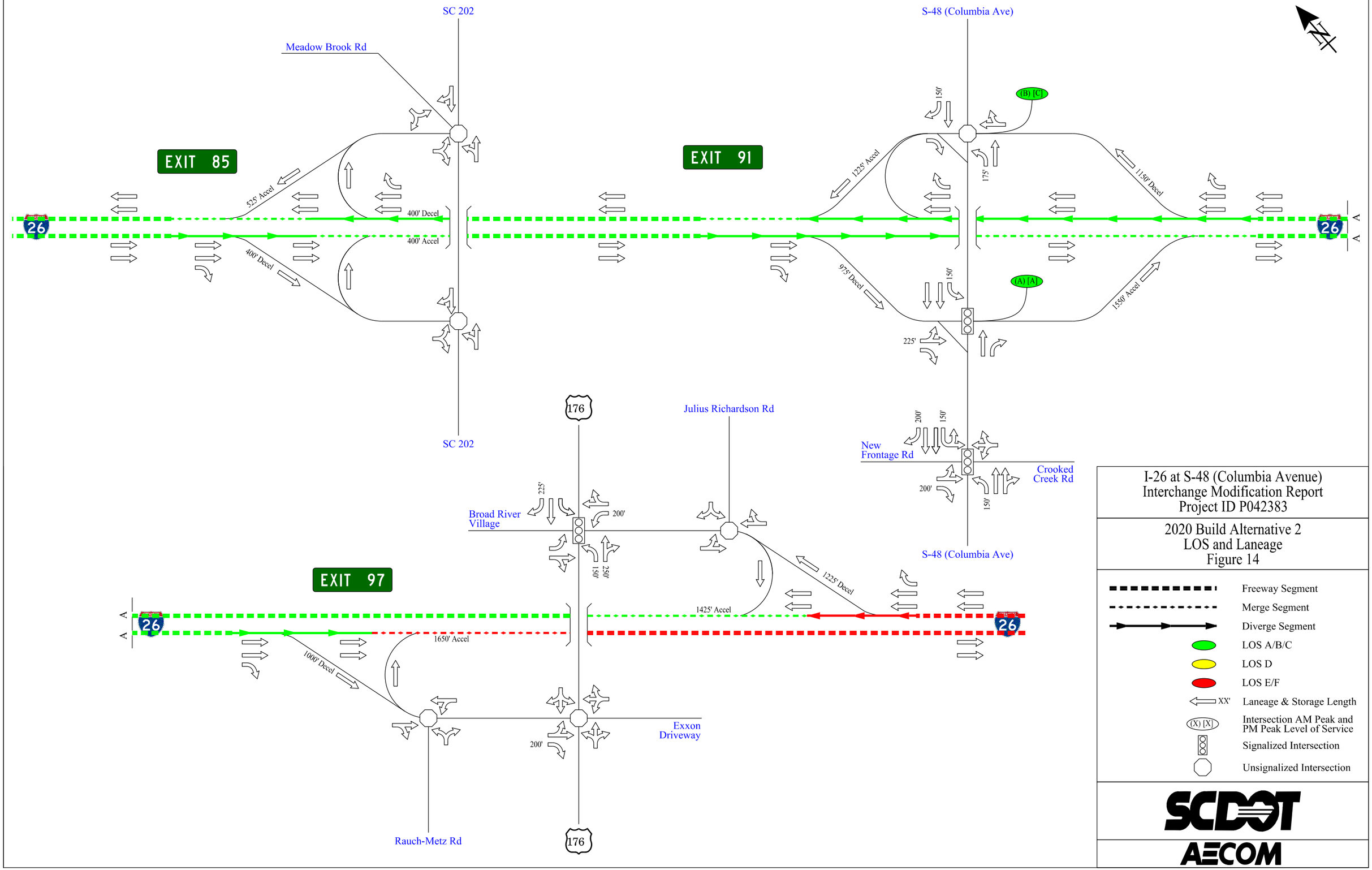


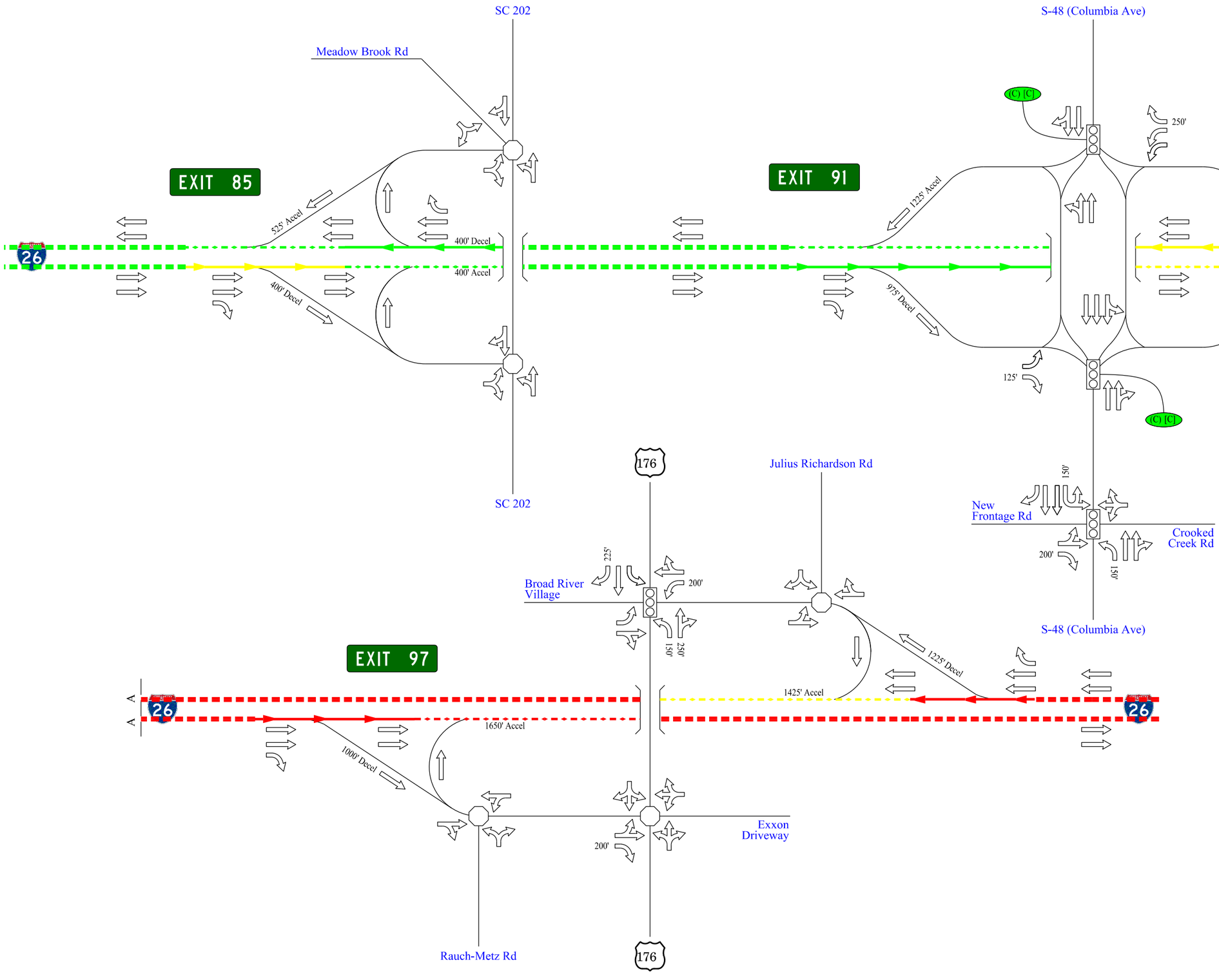
I-26 at S-48 (Columbia Avenue)
Interchange Modification Report
Project ID P042383

2020 Build Alternative 2
LOS and Laneage
Figure 14

- Freeway Segment
- Merge Segment
- Diverge Segment
- LOS A/B/C
- LOS D
- LOS E/F
- XX' Laneage & Storage Length
- (X) [X] Intersection AM Peak and PM Peak Level of Service
- Signalized Intersection
- Unsignalized Intersection

SCDOT

AECOM



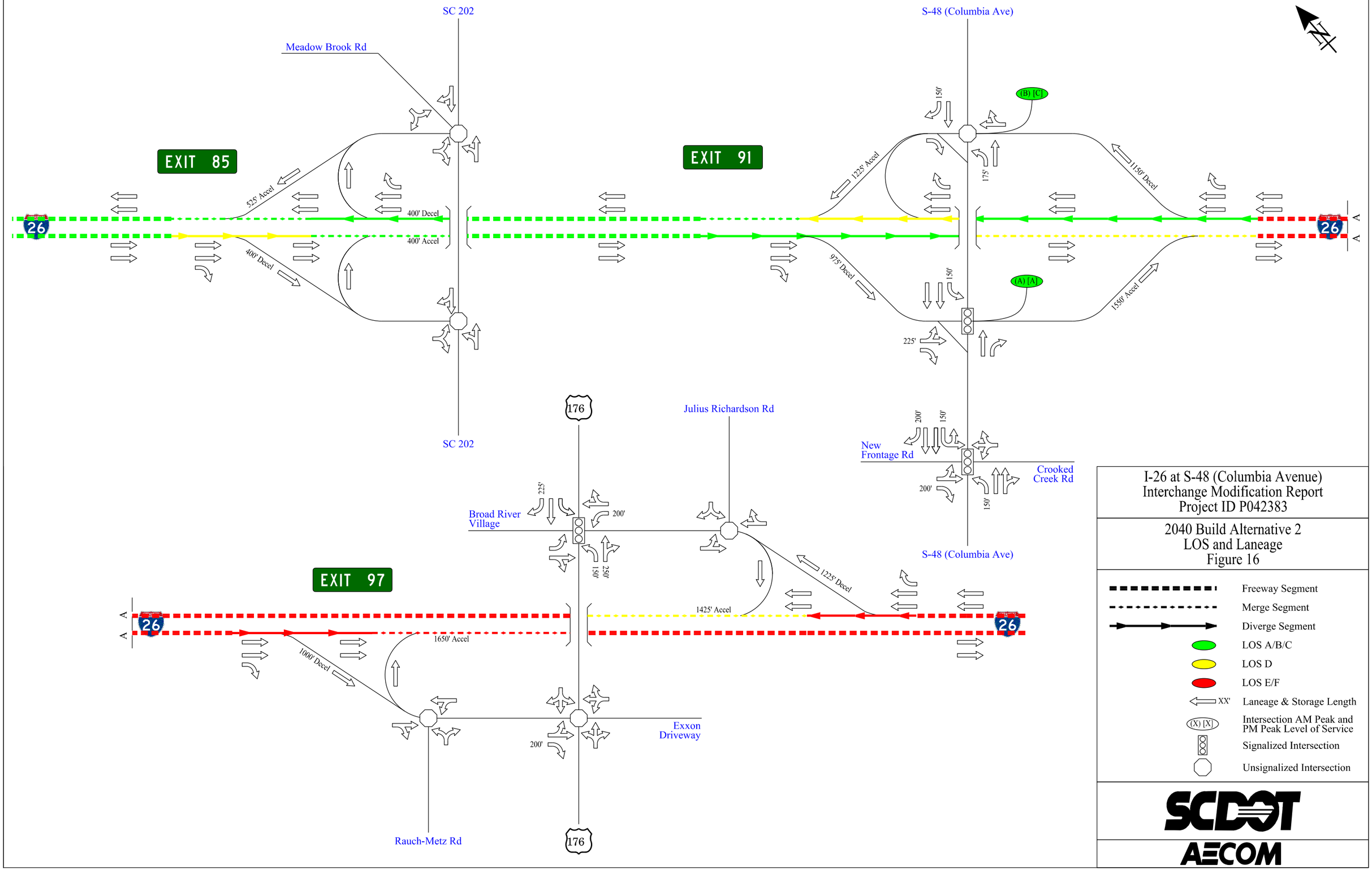
I-26 at S-48 (Columbia Avenue)
Interchange Modification Report
Project ID P042383

2040 Build Alternative 1
LOS and Laneage
Figure 15

- Freeway Segment
- Merge Segment
- Diverge Segment
- LOS A/B/C
- LOS D
- LOS E/F
- XX' Laneage & Storage Length
- (X) [X] Intersection AM Peak and PM Peak Level of Service
- Signalized Intersection
- Unsignalized Intersection

SCDOT

AECOM



I-26 at S-48 (Columbia Avenue)
Interchange Modification Report
Project ID P042383

2040 Build Alternative 2
LOS and Laneage
Figure 16

- Freeway Segment
- Merge Segment
- Diverge Segment
- LOS A/B/C
- LOS D
- LOS E/F
- XX' Laneage & Storage Length
- (X) [X] Intersection AM Peak and PM Peak Level of Service
- Signalized Intersection
- Unsignalized Intersection

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APPENDIX E

EXISTING 2014 HCS REPORTS

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AECOM
Agency or Company:	AECOM
Date Performed:	6/30/2016
Analysis Time Period:	AM Peak
Freeway/Direction:	I-26 EB
From/To:	West of SC 202
Jurisdiction:	
Analysis Year:	2014
Description:	S-48 IMR

Flow Inputs and Adjustments

Volume, V	1199	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	333	v
Trucks and buses	16	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.806	
Driver population factor, fp	1.00	
Flow rate, vp	826	pc/h/ln

Speed Inputs and Adjustments

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

LOS and Performance Measures

Flow rate, vp	826	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	2	
Density, D	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:	AECOM
Agency or Company:	AECOM
Date Performed:	6/30/2016
Analysis Time Period:	AM Peak
Freeway/Direction:	I-26 EB
From/To:	Between S-48 and SC 202
Jurisdiction:	
Analysis Year:	2014
Description:	S-48 IMR

Flow Inputs and Adjustments

Volume, V	1349	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	375	v
Trucks and buses	16	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.806	
Driver population factor, fp	1.00	
Flow rate, vp	929	pc/h/ln

Speed Inputs and Adjustments

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

LOS and Performance Measures

Flow rate, vp	929	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	2	
Density, D	12.4	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:	AECOM
Agency or Company:	AECOM
Date Performed:	6/30/2016
Analysis Time Period:	AM Peak
Freeway/Direction:	I-26 EB
From/To:	Between S-48 and US 176
Jurisdiction:	
Analysis Year:	2014
Description:	S-48 IMR

Flow Inputs and Adjustments

Volume, V	1981	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	550	v
Trucks and buses	16	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.806	
Driver population factor, fp	1.00	
Flow rate, vp	1365	pc/h/ln

Speed Inputs and Adjustments

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

LOS and Performance Measures

Flow rate, vp	1365	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	73.5	mi/h
Number of lanes, N	2	
Density, D	18.6	pc/mi/ln
Level of service, LOS	C	

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AECOM
Agency or Company:	AECOM
Date Performed:	6/30/2016
Analysis Time Period:	AM Peak
Freeway/Direction:	I-26 EB
From/To:	East of US176
Jurisdiction:	
Analysis Year:	2014
Description:	S-48 IMR

Flow Inputs and Adjustments

Volume, V	3315	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	921	v
Trucks and buses	16	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.806	
Driver population factor, fp	1.00	
Flow rate, vp	2284	pc/h/ln

Speed Inputs and Adjustments

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

LOS and Performance Measures

Flow rate, vp	2284	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	56.7	mi/h
Number of lanes, N	2	
Density, D	40.2	pc/mi/ln
Level of service, LOS	E	

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AECOM
Agency or Company:	AECOM
Date Performed:	6/30/2016
Analysis Time Period:	AM Peak
Freeway/Direction:	I-26 WB
From/To:	East of US 176
Jurisdiction:	
Analysis Year:	2014
Description:	S-48 IMR

Flow Inputs and Adjustments

Volume, V	1476	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	410	v
Trucks and buses	23	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.743	
Driver population factor, fp	1.00	
Flow rate, vp	1103	pc/h/ln

Speed Inputs and Adjustments

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

LOS and Performance Measures

Flow rate, vp	1103	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	74.9	mi/h
Number of lanes, N	2	
Density, D	14.7	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:	AECOM
Agency or Company:	AECOM
Date Performed:	6/30/2016
Analysis Time Period:	AM Peak
Freeway/Direction:	I-26 WB
From/To:	Between S-48 and US 176
Jurisdiction:	
Analysis Year:	2014
Description:	S-48 IMR

Flow Inputs and Adjustments

Volume, V	1195	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	332	v
Trucks and buses	23	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.743	
Driver population factor, fp	1.00	
Flow rate, vp	893	pc/h/ln

Speed Inputs and Adjustments

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

LOS and Performance Measures

Flow rate, vp	893	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	2	
Density, D	11.9	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:	AECOM
Agency or Company:	AECOM
Date Performed:	6/30/2016
Analysis Time Period:	AM Peak
Freeway/Direction:	I-26 WB
From/To:	Between S-48 and SC 202
Jurisdiction:	
Analysis Year:	2014
Description:	S-48 IMR

Flow Inputs and Adjustments

Volume, V	851	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	236	v
Trucks and buses	23	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.743	
Driver population factor, fp	1.00	
Flow rate, vp	636	pc/h/ln

Speed Inputs and Adjustments

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

LOS and Performance Measures

Flow rate, vp	636	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	2	
Density, D	8.5	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:	AECOM
Agency or Company:	AECOM
Date Performed:	6/30/2016
Analysis Time Period:	AM Peak
Freeway/Direction:	I-26 WB
From/To:	West of SC 202
Jurisdiction:	
Analysis Year:	2014
Description:	S-48 IMR

Flow Inputs and Adjustments

Volume, V	891	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	248	v
Trucks and buses	23	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.743	
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	0.33	ramps/mi
Number of lanes, N	2	
Free-flow speed:	Base	
FFS or BFFS	75.4	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
TRD adjustment	1.3	mi/h
Free-flow speed, FFS	74.1	mi/h

LOS and Performance Measures

Flow rate, vp	666	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	2	
Density, D	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:	AECOM
Agency or Company:	AECOM
Date Performed:	6/30/2016
Analysis Time Period:	PM Peak
Freeway/Direction:	I-26 EB
From/To:	West of SC 202
Jurisdiction:	
Analysis Year:	2014
Description:	S-48 IMR

Flow Inputs and Adjustments

Volume, V	1440	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	400	v
Trucks and buses	14	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.826	
Driver population factor, fp	1.00	
Flow rate, vp	968	pc/h/ln

Speed Inputs and Adjustments

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

LOS and Performance Measures

Flow rate, vp	968	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	2	
Density, D	12.9	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:	AECOM
Agency or Company:	AECOM
Date Performed:	6/30/2016
Analysis Time Period:	PM Peak
Freeway/Direction:	I-26 EB
From/To:	Between S-48 and SC 202
Jurisdiction:	
Analysis Year:	2014
Description:	S-48 IMR

Flow Inputs and Adjustments

Volume, V	1406	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	391	v
Trucks and buses	14	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.826	
Driver population factor, fp	1.00	
Flow rate, vp	945	pc/h/ln

Speed Inputs and Adjustments

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

LOS and Performance Measures

Flow rate, vp	945	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	2	
Density, D	12.6	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:	AECOM
Agency or Company:	AECOM
Date Performed:	6/30/2016
Analysis Time Period:	PM Peak
Freeway/Direction:	I-26 EB
From/To:	Between S-48 and US 176
Jurisdiction:	
Analysis Year:	2014
Description:	S-48 IMR

Flow Inputs and Adjustments

Volume, V	1804	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	501	v
Trucks and buses	14	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.826	
Driver population factor, fp	1.00	
Flow rate, vp	1213	pc/h/ln

Speed Inputs and Adjustments

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

LOS and Performance Measures

Flow rate, vp	1213	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	74.5	mi/h
Number of lanes, N	2	
Density, D	16.3	pc/mi/ln
Level of service, LOS	B	

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AECOM
Agency or Company:	AECOM
Date Performed:	6/30/2016
Analysis Time Period:	PM Peak
Freeway/Direction:	I-26 EB
From/To:	East of US176
Jurisdiction:	
Analysis Year:	2014
Description:	S-48 IMR

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	14	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.826	
Driver population factor, fp	1.00	
Flow rate, vp	1616	pc/h/ln

Speed Inputs and Adjustments

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

LOS and Performance Measures

Flow rate, vp	1616	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	70.8	mi/h
Number of lanes, N	2	
Density, D	22.8	pc/mi/ln
Level of service, LOS	C	

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AECOM
Agency or Company:	AECOM
Date Performed:	6/30/2016
Analysis Time Period:	PM Peak
Freeway/Direction:	I-26 WB
From/To:	East of US 176
Jurisdiction:	
Analysis Year:	2014
Description:	S-48 IMR

Flow Inputs and Adjustments

Volume, V	3049	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	847	v
Trucks and buses	13	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.837	
Driver population factor, fp	1.00	
Flow rate, vp	2024	pc/h/ln

Speed Inputs and Adjustments

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

LOS and Performance Measures

Flow rate, vp	2024	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	63.4	mi/h
Number of lanes, N	2	
Density, D	31.9	pc/mi/ln
Level of service, LOS	D	

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AECOM
Agency or Company:	AECOM
Date Performed:	6/30/2016
Analysis Time Period:	PM Peak
Freeway/Direction:	I-26 WB
From/To:	Between S-48 and US 176
Jurisdiction:	
Analysis Year:	2014
Description:	S-48 IMR

Flow Inputs and Adjustments

Volume, V	1870	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	519	v
Trucks and buses	13	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.837	
Driver population factor, fp	1.00	
Flow rate, vp	1241	pc/h/ln

Speed Inputs and Adjustments

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

LOS and Performance Measures

Flow rate, vp	1241	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	74.4	mi/h
Number of lanes, N	2	
Density, D	16.7	pc/mi/ln
Level of service, LOS	B	

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AECOM
Agency or Company:	AECOM
Date Performed:	6/30/2016
Analysis Time Period:	PM Peak
Freeway/Direction:	I-26 WB
From/To:	Between S-48 and SC 202
Jurisdiction:	
Analysis Year:	2014
Description:	S-48 IMR

Flow Inputs and Adjustments

Volume, V	1271	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	353	v
Trucks and buses	13	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.837	
Driver population factor, fp	1.00	
Flow rate, vp	844	pc/h/ln

Speed Inputs and Adjustments

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

LOS and Performance Measures

Flow rate, vp	844	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	2	
Density, D	11.3	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:	AECOM
Agency or Company:	AECOM
Date Performed:	6/30/2016
Analysis Time Period:	PM Peak
Freeway/Direction:	I-26 WB
From/To:	West of SC 202
Jurisdiction:	
Analysis Year:	2014
Description:	S-48 IMR

Flow Inputs and Adjustments

Volume, V	1215	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	338	v
Trucks and buses	13	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.837	
Driver population factor, fp	1.00	
Flow rate, vp	807	pc/h/ln

Speed Inputs and Adjustments

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

LOS and Performance Measures

Flow rate, vp	807	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	2	
Density, D	10.8	pc/mi/ln
Level of service, LOS	A	

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

HCS 2010: Freeway Merge and Diverge Segments Release 6.65

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	6/30/2016
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 EB
Junction:	SC-202 EB On-Ramp
Jurisdiction:	
Analysis Year:	2014
Description:	S-48 IMR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	1164	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	25.0	mph
Volume on ramp	185	vph
Length of first accel/decel lane	400	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	35	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1050	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1164	185	35	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	323	51	10	v
Trucks and buses	16	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.806	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1604	212	40	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1604 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1816	4800	No

v_3 or v_{av34} = 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 1604 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	1816	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 17.0 pc/mi/ln

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

Speed Estimation

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

HCS 2010: Freeway Merge and Diverge Segments Release 6.65

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	6/30/2016
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 EB
Junction:	S-48 EB On-Ramp
Jurisdiction:	
Analysis Year:	2014
Description:	S-48 IMR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	1248	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	733	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	101	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1725	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1248	733	101	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	347	204	28	v
Trucks and buses	16	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.806	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1719	839	116	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1719 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2558	4800	No

v_3 or v_{av34} = 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12}/2 No

If yes, v_{12A} = 1719 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2558	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 15.6 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.236	
Space mean speed in ramp influence area,	S_R = 67.2	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 67.2	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.65

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	6/30/2016
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 EB
Junction:	US176 EB On-Ramp
Jurisdiction:	
Analysis Year:	2014
Description:	S-48 IMR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	1869	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	25.0	mph
Volume on ramp	1446	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	112	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	900	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1869	1446	112	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	519	402	31	v
Trucks and buses	16	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	1.5	
Recreational vehicle PCE, ER	2.0	2.0	1.2	

Heavy vehicle adjustment, fHV	0.806	0.971	0.990	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2575	1655	126	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2575 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4230	4800	No

v_3 or v_{av34} = 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 2575 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	4230	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ = 28.3 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.514	
Space mean speed in ramp influence area,	S_R = 58.0	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 58.0	mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	6/30/2016
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 WB
Junction:	US 176 WB On-Ramp
Jurisdiction:	
Analysis Year:	2014
Description:	S-48 IMR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	1028	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	25.0	mph
Volume on ramp	167	vph
Length of first accel/decel lane	1425	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	448	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	775	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1028	167	448	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	286	46	124	v
Trucks and buses	23	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.743	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1536	191	513	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1536 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1727	4800	No

v_3 or v_{av34} = 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 1536 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	1727	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 9.9 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.272	
Space mean speed in ramp influence area,	S_R = 66.0	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 66.0	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.65

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	6/30/2016
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 WB
Junction:	S-48 WB On-Ramp
Jurisdiction:	
Analysis Year:	2014
Description:	S-48 IMR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	753	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	98	vph
Length of first accel/decel lane	1225	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	442	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1475	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	753	98	442	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	209	27	123	v
Trucks and buses	23	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.743	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1125	112	506	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1125 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1237	4800	No

v_3 or v_{av34} = 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 1125 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	1237	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 7.4 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.224

Space mean speed in ramp influence area, S_R = 67.6 mph

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

Space mean speed for all vehicles, S = 67.6 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.65

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	6/30/2016
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 WB
Junction:	SC-202 WB On-Ramp
Jurisdiction:	
Analysis Year:	2014
Description:	S-48 IMR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	826	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	65	vph
Length of first accel/decel lane	525	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	25	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	826	65	25	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	229	18	7	v
Trucks and buses	23	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.743	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1234	74	29	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1234 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1308	4800	No

v_3 or v_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 1234 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	1308	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ = 12.4 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.288	
Space mean speed in ramp influence area,	S_R = 65.5	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 65.5	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.65

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	6/30/2016
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 EB
Junction:	SC-202 EB On-Ramp
Jurisdiction:	
Analysis Year:	2014
Description:	S-48 IMR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	1372	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	25.0	mph
Volume on ramp	34	vph
Length of first accel/decel lane	400	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	68	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1050	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1372	34	68	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	381	9	19	v
Trucks and buses	14	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.826	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1845	39	78	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1845 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1884	4800	No

v_3 or v_{av34} = 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 1845 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	1884	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ = 17.6 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.327	
Space mean speed in ramp influence area,	S_R = 64.2	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 64.2	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.65

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	6/30/2016
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 EB
Junction:	S-48 EB On-Ramp
Jurisdiction:	
Analysis Year:	2014
Description:	S-48 IMR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	1303	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	501	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	103	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1725	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1303	501	103	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	362	139	29	v
Trucks and buses	14	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.826	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1752	573	118	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1752 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2325	4800	No

v_3 or v_{av34} = 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 1752 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2325	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ = 13.9 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.226	
Space mean speed in ramp influence area,	S_R = 67.5	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 67.5	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.65

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	6/30/2016
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 EB
Junction:	US176 EB On-Ramp
Jurisdiction:	
Analysis Year:	2014
Description:	S-48 IMR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	1590	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	25.0	mph
Volume on ramp	814	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	214	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	900	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1590	814	214	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	442	226	59	v
Trucks and buses	14	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	1.5	
Recreational vehicle PCE, ER	2.0	2.0	1.2	

Heavy vehicle adjustment, fHV	0.826	0.971	0.990	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2138	932	240	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

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

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3070	4800	No

v_3 or v_{av34} = 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12}/2 No

If yes, v_{12A} = 2138 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	3070	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 19.6 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.330

Space mean speed in ramp influence area, S_R = 64.1 mph

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

Space mean speed for all vehicles, S = 64.1 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.65

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	6/30/2016
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 WB
Junction:	US 176 WB On-Ramp
Jurisdiction:	
Analysis Year:	2014
Description:	S-48 IMR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	1737	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	25.0	mph
Volume on ramp	133	vph
Length of first accel/decel lane	1425	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	1312	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	775	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1737	133	1312	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	483	37	364	v
Trucks and buses	13	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.837	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2306	152	1502	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2306 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2458	4800	No

v_3 or v_{av34} = 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 2306 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2458	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ = 15.6 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.295	
Space mean speed in ramp influence area,	S_R = 65.3	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 65.3	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.65

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	6/30/2016
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 WB
Junction:	S-48 WB On-Ramp
Jurisdiction:	
Analysis Year:	2014
Description:	S-48 IMR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	1153	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	118	vph
Length of first accel/decel lane	1225	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	717	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1475	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1153	118	717	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	320	33	199	v
Trucks and buses	13	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.837	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1531	135	821	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1531 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1666	4800	No

v_3 or v_{av34} = 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12}/2 No

If yes, v_{12A} = 1531 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	1666	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 10.7 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.231	
Space mean speed in ramp influence area,	S_R = 67.4	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 67.4	mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	6/30/2016
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 WB
Junction:	SC-202 WB On-Ramp
Jurisdiction:	
Analysis Year:	2014
Description:	S-48 IMR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	1165	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	50	vph
Length of first accel/decel lane	525	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	106	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1165	50	106	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	324	14	29	v
Trucks and buses	13	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.837	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1547	57	121	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1547 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1604	4800	No

v_3 or v_{av34} = 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12}/2 No

If yes, v_{12A} = 1547 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	1604	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ = 14.7 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.293	
Space mean speed in ramp influence area,	S_R = 65.3	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 65.3	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	7/1/2016
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 EB
Junction:	SC 202 EB Off-Ramp
Jurisdiction:	
Analysis Year:	2014
Description:	S-48 IMR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	1199	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	35	vph
Length of first accel/decel lane	400	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	185	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1050	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1199	35	185	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	333	10	51	v
Trucks and buses	16	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.806	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1652	40	212	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1652 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1652	4800	No
$v_{FO} = v_F - v_R$	1612	4800	No
v_R	40	2100	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 1652 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1652	4400	No

Level of Service Determination (if not F)

Density, $D_D = 4.252 + 0.0086 v_R - 0.009 L_{12}$ = 14.9 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.302

Space mean speed in ramp influence area, S_R = 65.0 mph

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

Space mean speed for all vehicles, S = 65.0 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.65

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	7/1/2016
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 EB
Junction:	S-48 EB Off-Ramp
Jurisdiction:	
Analysis Year:	2014
Description:	S-48 IMR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	1349	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	101	vph
Length of first accel/decel lane	975	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	733	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1725	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1349	101	733	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	375	28	204	v
Trucks and buses	16	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.806	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1859	116	839	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1859 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1859	4800	No
$v_{FO} = v_F - v_R$	1743	4800	No
v_R	116	2100	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 1859 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1859	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, L_{12}$ = 11.5 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.308

Space mean speed in ramp influence area, S_R = 64.8 mph

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

Space mean speed for all vehicles, S = 64.8 mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	7/1/2016
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 EB
Junction:	US 176 EB Off-Ramp
Jurisdiction:	
Analysis Year:	2014
Description:	S-48 IMR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	1981	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	112	vph
Length of first accel/decel lane	1000	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1446	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	900	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1981	112	1446	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	550	31	402	v
Trucks and buses	16	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.806	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2729	128	1655	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2729 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2729	4800	No
$v_{FO} = v_F - v_R$	2601	4800	No
v_R	128	2100	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 2729 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2729	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_R - 0.009 L_{12}$ = 18.7 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.310

Space mean speed in ramp influence area, S_R = 64.8 mph

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

Space mean speed for all vehicles, S = 64.8 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.65

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	7/1/2016
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 WB
Junction:	US 176 WB Off-Ramp
Jurisdiction:	
Analysis Year:	2014
Description:	S-48 IMR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	1476	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	448	vph
Length of first accel/decel lane	1225	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	167	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	775	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1476	448	167	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	410	124	46	v
Trucks and buses	23	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.743	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2206	513	191	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2206 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2206	4800	No
$v_{FO} = v_F - v_R$	1693	4800	No
v_R	513	2100	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 2206 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2206	4400	No

Level of Service Determination (if not F)

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

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

Speed Estimation

Intermediate speed variable, D_S = 0.344

Space mean speed in ramp influence area, S_R = 63.6 mph

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

Space mean speed for all vehicles, S = 63.6 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.65

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	7/1/2016
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 WB
Junction:	S-48 WB Off-Ramp
Jurisdiction:	
Analysis Year:	2014
Description:	S-48 IMR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	1195	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	442	vph
Length of first accel/decel lane	1225	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	98	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1475	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1195	442	98	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	332	123	27	v
Trucks and buses	23	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.743	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1786	506	112	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1786 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1786	4800	No
$v_{FO} = v_F - v_R$	1280	4800	No
v_R	506	2100	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12}/2 No

If yes, v_{12A} = 1786 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1786	4400	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 8.6 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.344

Space mean speed in ramp influence area, S_R = 63.7 mph

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

Space mean speed for all vehicles, S = 63.7 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.65

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	7/1/2016
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 WB
Junction:	SC 202 WB Off-Ramp
Jurisdiction:	
Analysis Year:	2014
Description:	S-48 IMR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	851	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	25.0	mph
Volume on ramp	25	vph
Length of first accel/decel lane	400	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	65	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	851	25	65	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	236	7	18	v
Trucks and buses	23	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.743	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1272	29	74	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1272 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1272	4800	No
$v_{FO} = v_F - v_R$	1243	4800	No
v_R	29	1900	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 1272 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1272	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_R - 0.009 L_{12}$ = 11.6 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.561

Space mean speed in ramp influence area, S_R = 56.5 mph

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

Space mean speed for all vehicles, S = 56.5 mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	7/1/2016
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 EB
Junction:	SC 202 EB Off-Ramp
Jurisdiction:	
Analysis Year:	2014
Description:	S-48 IMR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	1440	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	68	vph
Length of first accel/decel lane	400	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	34	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1050	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1440	68	34	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	400	19	9	v
Trucks and buses	14	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.826	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1936	78	39	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1936 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1936	4800	No
$v_{FO} = v_F - v_R$	1858	4800	No
v_R	78	2100	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 1936 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1936	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, L_{12}$ = 17.3 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.305

Space mean speed in ramp influence area, S_R = 64.9 mph

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

Space mean speed for all vehicles, S = 64.9 mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	7/1/2016
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 EB
Junction:	S-48 EB Off-Ramp
Jurisdiction:	
Analysis Year:	2014
Description:	S-48 IMR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	1406	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	103	vph
Length of first accel/decel lane	975	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	501	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1725	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1406	103	501	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	391	29	139	v
Trucks and buses	14	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.826	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1890	118	573	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1890 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1890	4800	No
$v_{FO} = v_F - v_R$	1772	4800	No
v_R	118	2100	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 1890 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1890	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, L_{12}$ = 11.7 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.309

Space mean speed in ramp influence area, S_R = 64.8 mph

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

Space mean speed for all vehicles, S = 64.8 mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	7/1/2016
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 EB
Junction:	US 176 EB Off-Ramp
Jurisdiction:	
Analysis Year:	2014
Description:	S-48 IMR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	1804	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	214	vph
Length of first accel/decel lane	1000	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	814	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	900	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1804	214	814	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	501	59	226	v
Trucks and buses	14	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.826	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2425	245	932	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2425 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2425	4800	No
$v_{FO} = v_F - v_R$	2180	4800	No
v_R	245	2100	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 2425 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2425	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_R - 0.009 L_D$ = 16.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.320

Space mean speed in ramp influence area, S_R = 64.4 mph

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

Space mean speed for all vehicles, S = 64.4 mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	7/1/2016
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 WB
Junction:	US 176 WB Off-Ramp
Jurisdiction:	
Analysis Year:	2014
Description:	S-48 IMR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	3049	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	1312	vph
Length of first accel/decel lane	1225	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	133	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	775	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3049	1312	133	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	847	364	37	v
Trucks and buses	13	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.837	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	4048	1502	152	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 4048 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4048	4800	No
$v_{FO} = v_F - v_R$	2546	4800	No
v_R	1502	2100	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 4048 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	4048	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_R - 0.009 L_{12}$ = 28.0+ pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.433

Space mean speed in ramp influence area, S_R = 60.7 mph

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

Space mean speed for all vehicles, S = 60.7 mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	7/1/2016
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 WB
Junction:	S-48 WB Off-Ramp
Jurisdiction:	
Analysis Year:	2014
Description:	S-48 IMR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	1870	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	717	vph
Length of first accel/decel lane	1225	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	118	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1475	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1870	717	118	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	519	199	33	v
Trucks and buses	13	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.837	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2483	821	135	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2483 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2483	4800	No
$v_{FO} = v_F - v_R$	1662	4800	No
v_R	821	2100	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 2483 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2483	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_R - 0.009 L_D$ = 14.6 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.372

Space mean speed in ramp influence area, S_R = 62.7 mph

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

Space mean speed for all vehicles, S = 62.7 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.65

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	7/1/2016
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 WB
Junction:	SC 202 WB Off-Ramp
Jurisdiction:	
Analysis Year:	2014
Description:	S-48 IMR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	1271	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	25.0	mph
Volume on ramp	106	vph
Length of first accel/decel lane	400	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	50	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1271	106	50	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	353	29	14	v
Trucks and buses	13	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.837	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1688	121	57	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1688 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1688	4800	No
$v_{FO} = v_F - v_R$	1567	4800	No
v_R	121	1900	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 1688 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1688	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, L_{12}$ = 15.2 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.569

Space mean speed in ramp influence area, S_R = 56.2 mph

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

Space mean speed for all vehicles, S = 56.2 mph

APPENDIX G

NO-BUILD 2020 HCS REPORTS

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AECOM
Agency or Company:	AECOM
Date Performed:	6/30/2016
Analysis Time Period:	AM Peak
Freeway/Direction:	I-26 EB
From/To:	West of SC 202
Jurisdiction:	
Analysis Year:	2020 No-Build
Description:	S-48 IMR

Flow Inputs and Adjustments

Volume, V	1385	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	385	v
Trucks and buses	16	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.806	
Driver population factor, fp	1.00	
Flow rate, vp	954	pc/h/ln

Speed Inputs and Adjustments

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

LOS and Performance Measures

Flow rate, vp	954	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	2	
Density, D	12.7	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:	AECOM
Agency or Company:	AECOM
Date Performed:	6/30/2016
Analysis Time Period:	AM Peak
Freeway/Direction:	I-26 EB
From/To:	Between S-48 and SC 202
Jurisdiction:	
Analysis Year:	2020 No-Build
Description:	S-48 IMR

Flow Inputs and Adjustments

Volume, V	1546	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	429	v
Trucks and buses	16	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.806	
Driver population factor, fp	1.00	
Flow rate, vp	1065	pc/h/ln

Speed Inputs and Adjustments

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

LOS and Performance Measures

Flow rate, vp	1065	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	2	
Density, D	14.2	pc/mi/ln
Level of service, LOS	B	

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AECOM
Agency or Company:	AECOM
Date Performed:	6/30/2016
Analysis Time Period:	AM Peak
Freeway/Direction:	I-26 EB
From/To:	Between S-48 and US 176
Jurisdiction:	
Analysis Year:	2020 No-Build
Description:	S-48 IMR

Flow Inputs and Adjustments

Volume, V	2475	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	688	v
Trucks and buses	16	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.806	
Driver population factor, fp	1.00	
Flow rate, vp	1705	pc/h/ln

Speed Inputs and Adjustments

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

LOS and Performance Measures

Flow rate, vp	1705	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	69.5	mi/h
Number of lanes, N	2	
Density, D	24.5	pc/mi/ln
Level of service, LOS	C	

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AECOM
Agency or Company:	AECOM
Date Performed:	6/30/2016
Analysis Time Period:	AM Peak
Freeway/Direction:	I-26 EB
From/To:	East of US176
Jurisdiction:	
Analysis Year:	2020 No-Build
Description:	S-48 IMR

Flow Inputs and Adjustments

Volume, V	3909	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1086	v
Trucks and buses	16	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.806	
Driver population factor, fp	1.00	
Flow rate, vp	2693	pc/h/ln

Speed Inputs and Adjustments

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

LOS and Performance Measures

Flow rate, vp	2693	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	43.3	mi/h
Number of lanes, N	2	
Density, D	62.2	pc/mi/ln
Level of service, LOS	F	

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AECOM
Agency or Company:	AECOM
Date Performed:	6/30/2016
Analysis Time Period:	AM Peak
Freeway/Direction:	I-26 WB
From/To:	East of US 176
Jurisdiction:	
Analysis Year:	2020 No-Build
Description:	S-48 IMR

Flow Inputs and Adjustments

Volume, V	2015	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	560	v
Trucks and buses	23	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.743	
Driver population factor, fp	1.00	
Flow rate, vp	1506	pc/h/ln

Speed Inputs and Adjustments

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

LOS and Performance Measures

Flow rate, vp	1506	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	72.2	mi/h
Number of lanes, N	2	
Density, D	20.9	pc/mi/ln
Level of service, LOS	C	

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AECOM
Agency or Company:	AECOM
Date Performed:	6/30/2016
Analysis Time Period:	AM Peak
Freeway/Direction:	I-26 WB
From/To:	Between S-48 and US 176
Jurisdiction:	
Analysis Year:	2020 No-Build
Description:	S-48 IMR

Flow Inputs and Adjustments

Volume, V	1713	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	476	v
Trucks and buses	23	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.743	
Driver population factor, fp	1.00	
Flow rate, vp	1280	pc/h/ln

Speed Inputs and Adjustments

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

LOS and Performance Measures

Flow rate, vp	1280	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	74.1	mi/h
Number of lanes, N	2	
Density, D	17.3	pc/mi/ln
Level of service, LOS	B	

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AECOM
Agency or Company:	AECOM
Date Performed:	6/30/2016
Analysis Time Period:	AM Peak
Freeway/Direction:	I-26 WB
From/To:	Between S-48 and SC 202
Jurisdiction:	
Analysis Year:	2020 No-Build
Description:	S-48 IMR

Flow Inputs and Adjustments

Volume, V	1004	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	279	v
Trucks and buses	23	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.743	
Driver population factor, fp	1.00	
Flow rate, vp	750	pc/h/ln

Speed Inputs and Adjustments

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

LOS and Performance Measures

Flow rate, vp	750	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	2	
Density, D	10.0	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:	AECOM
Agency or Company:	AECOM
Date Performed:	6/30/2016
Analysis Time Period:	AM Peak
Freeway/Direction:	I-26 WB
From/To:	West of SC 202
Jurisdiction:	
Analysis Year:	2020 No-Build
Description:	S-48 IMR

Flow Inputs and Adjustments

Volume, V	1047	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	291	v
Trucks and buses	23	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.743	
Driver population factor, fp	1.00	
Flow rate, vp	782	pc/h/ln

Speed Inputs and Adjustments

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

LOS and Performance Measures

Flow rate, vp	782	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	2	
Density, D	10.4	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:	AECOM
Agency or Company:	AECOM
Date Performed:	6/30/2016
Analysis Time Period:	PM Peak
Freeway/Direction:	I-26 EB
From/To:	West of SC 202
Jurisdiction:	
Analysis Year:	2020 No-Build
Description:	S-48 IMR

Flow Inputs and Adjustments

Volume, V	1714	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	476	v
Trucks and buses	14	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.826	
Driver population factor, fp	1.00	
Flow rate, vp	1152	pc/h/ln

Speed Inputs and Adjustments

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

LOS and Performance Measures

Flow rate, vp	1152	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	74.7	mi/h
Number of lanes, N	2	
Density, D	15.4	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:	AECOM
Agency or Company:	AECOM
Date Performed:	6/30/2016
Analysis Time Period:	PM Peak
Freeway/Direction:	I-26 EB
From/To:	Between S-48 and SC 202
Jurisdiction:	
Analysis Year:	2020 No-Build
Description:	S-48 IMR

Flow Inputs and Adjustments

Volume, V	1677	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	466	v
Trucks and buses	14	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.826	
Driver population factor, fp	1.00	
Flow rate, vp	1127	pc/h/ln

Speed Inputs and Adjustments

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

LOS and Performance Measures

Flow rate, vp	1127	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	74.8	mi/h
Number of lanes, N	2	
Density, D	15.1	pc/mi/ln
Level of service, LOS	B	

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AECOM
Agency or Company:	AECOM
Date Performed:	6/30/2016
Analysis Time Period:	PM Peak
Freeway/Direction:	I-26 EB
From/To:	Between S-48 and US 176
Jurisdiction:	
Analysis Year:	2020 No-Build
Description:	S-48 IMR

Flow Inputs and Adjustments

Volume, V	2499	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	694	v
Trucks and buses	14	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.826	
Driver population factor, fp	1.00	
Flow rate, vp	1680	pc/h/ln

Speed Inputs and Adjustments

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

LOS and Performance Measures

Flow rate, vp	1680	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	69.9	mi/h
Number of lanes, N	2	
Density, D	24.0	pc/mi/ln
Level of service, LOS	C	

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AECOM
Agency or Company:	AECOM
Date Performed:	6/30/2016
Analysis Time Period:	PM Peak
Freeway/Direction:	I-26 EB
From/To:	East of US176
Jurisdiction:	
Analysis Year:	2020 No-Build
Description:	S-48 IMR

Flow Inputs and Adjustments

Volume, V	3144	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	873	v
Trucks and buses	14	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.826	
Driver population factor, fp	1.00	
Flow rate, vp	2113	pc/h/ln

Speed Inputs and Adjustments

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

LOS and Performance Measures

Flow rate, vp	2113	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	61.3	mi/h
Number of lanes, N	2	
Density, D	34.5	pc/mi/ln
Level of service, LOS	D	

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AECOM
Agency or Company:	AECOM
Date Performed:	6/30/2016
Analysis Time Period:	PM Peak
Freeway/Direction:	I-26 WB
From/To:	East of US 176
Jurisdiction:	
Analysis Year:	2020 No-Build
Description:	S-48 IMR

Flow Inputs and Adjustments

Volume, V	3790	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1053	v
Trucks and buses	13	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.837	
Driver population factor, fp	1.00	
Flow rate, vp	2516	pc/h/ln

Speed Inputs and Adjustments

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

LOS and Performance Measures

Flow rate, vp	2516	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	49.6	mi/h
Number of lanes, N	2	
Density, D	50.8	pc/mi/ln
Level of service, LOS	F	

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AECOM
Agency or Company:	AECOM
Date Performed:	6/30/2016
Analysis Time Period:	PM Peak
Freeway/Direction:	I-26 WB
From/To:	Between S-48 and US 176
Jurisdiction:	
Analysis Year:	2020 No-Build
Description:	S-48 IMR

Flow Inputs and Adjustments

Volume, V	2523	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	701	v
Trucks and buses	13	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.837	
Driver population factor, fp	1.00	
Flow rate, vp	1675	pc/h/ln

Speed Inputs and Adjustments

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

LOS and Performance Measures

Flow rate, vp	1675	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	70.0	mi/h
Number of lanes, N	2	
Density, D	23.9	pc/mi/ln
Level of service, LOS	C	

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AECOM
Agency or Company:	AECOM
Date Performed:	6/30/2016
Analysis Time Period:	PM Peak
Freeway/Direction:	I-26 WB
From/To:	Between S-48 and SC 202
Jurisdiction:	
Analysis Year:	2020 No-Build
Description:	S-48 IMR

Flow Inputs and Adjustments

Volume, V	1519	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	422	v
Trucks and buses	13	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.837	
Driver population factor, fp	1.00	
Flow rate, vp	1008	pc/h/ln

Speed Inputs and Adjustments

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

LOS and Performance Measures

Flow rate, vp	1008	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	2	
Density, D	13.4	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:	AECOM
Agency or Company:	AECOM
Date Performed:	6/30/2016
Analysis Time Period:	PM Peak
Freeway/Direction:	I-26 WB
From/To:	West of SC 202
Jurisdiction:	
Analysis Year:	2020 No-Build
Description:	S-48 IMR

Flow Inputs and Adjustments

Volume, V	1459	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	405	v
Trucks and buses	13	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.837	
Driver population factor, fp	1.00	
Flow rate, vp	969	pc/h/ln

Speed Inputs and Adjustments

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

LOS and Performance Measures

Flow rate, vp	969	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	2	
Density, D	12.9	pc/mi/ln
Level of service, LOS	B	

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

HCS 2010: Freeway Merge and Diverge Segments Release 6.65

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	6/30/2016
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 EB
Junction:	SC-202 EB On-Ramp
Jurisdiction:	
Analysis Year:	2020 No-Build
Description:	S-48 IMR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	1347	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	25.0	mph
Volume on ramp	199	vph
Length of first accel/decel lane	400	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	38	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1050	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1347	199	38	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	374	55	11	v
Trucks and buses	16	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.806	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1856	228	43	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1856 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2084	4800	No

v_3 or v_{av34} = 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12}/2 No

If yes, v_{12A} = 1856 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2084	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ = 19.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.332	
Space mean speed in ramp influence area,	S_R = 64.0	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 64.0	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.65

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	6/30/2016
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 EB
Junction:	S-48 EB On-Ramp
Jurisdiction:	
Analysis Year:	2020 No-Build
Description:	S-48 IMR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	1382	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	1093	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	164	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1725	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1382	1093	164	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	384	304	46	v
Trucks and buses	16	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.806	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1904	1251	188	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1904 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3155	4800	No

v_3 or v_{av34} = 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 1904 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	3155	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ = 20.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.277	
Space mean speed in ramp influence area,	S_R = 65.8	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 65.8	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.65

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	6/30/2016
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 EB
Junction:	US176 EB On-Ramp
Jurisdiction:	
Analysis Year:	2020 No-Build
Description:	S-48 IMR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	2354	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	25.0	mph
Volume on ramp	1555	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	121	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	900	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2354	1555	121	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	654	432	34	v
Trucks and buses	16	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	1.5	
Recreational vehicle PCE, ER	2.0	2.0	1.2	

Heavy vehicle adjustment, fHV	0.806	0.971	0.990	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3243	1780	136	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 3243 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	5023	4800	Yes

v_3 or v_{av34} = 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 3243 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	5023	4600	Yes

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ = 34.4 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.838	
Space mean speed in ramp influence area,	S_R = 47.3	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 47.3	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.65

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	6/30/2016
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 WB
Junction:	US 176 WB On-Ramp
Jurisdiction:	
Analysis Year:	2020 No-Build
Description:	S-48 IMR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	1533	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	25.0	mph
Volume on ramp	180	vph
Length of first accel/decel lane	1425	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	482	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	775	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1533	180	482	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	426	50	134	v
Trucks and buses	23	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.743	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2291	206	552	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2291 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2497	4800	No

v_3 or v_{av34} = 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 2291 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2497	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 15.9 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.297	
Space mean speed in ramp influence area,	S_R = 65.2	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 65.2	mph

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	6/30/2016
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 WB
Junction:	S-48 WB On-Ramp
Jurisdiction:	
Analysis Year:	2020 No-Build
Description:	S-48 IMR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	863	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	141	vph
Length of first accel/decel lane	1225	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	850	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1475	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	863	141	850	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	240	39	236	v
Trucks and buses	23	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.743	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1290	161	973	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1290 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1451	4800	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 1290 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	1451	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 9.0 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.227	
Space mean speed in ramp influence area,	S_R = 67.5	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 67.5	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.65

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	6/30/2016
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 WB
Junction:	SC-202 WB On-Ramp
Jurisdiction:	
Analysis Year:	2020 No-Build
Description:	S-48 IMR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	977	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	70	vph
Length of first accel/decel lane	525	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	27	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	977	70	27	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	271	19	8	v
Trucks and buses	23	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.743	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1460	80	31	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1460 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1540	4800	No

v_3 or v_{av34} = 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12}/2 No

If yes, v_{12A} = 1460 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	1540	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 14.2 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.292	
Space mean speed in ramp influence area,	S_R = 65.4	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 65.4	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.65

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	6/30/2016
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 EB
Junction:	SC-202 EB On-Ramp
Jurisdiction:	
Analysis Year:	2020 No-Build
Description:	S-48 IMR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	1640	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	25.0	mph
Volume on ramp	37	vph
Length of first accel/decel lane	400	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	74	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1050	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1640	37	74	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	456	10	21	v
Trucks and buses	14	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.826	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2205	42	85	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2205 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2247	4800	No

v_3 or v_{av34} = 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 2205 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2247	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ = 20.5 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.338	
Space mean speed in ramp influence area,	S_R = 63.8	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 63.8	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.65

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	6/30/2016
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 EB
Junction:	S-48 EB On-Ramp
Jurisdiction:	
Analysis Year:	2020 No-Build
Description:	S-48 IMR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	1503	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	996	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	174	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1725	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1503	996	174	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	418	277	48	v
Trucks and buses	14	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.826	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2021	1140	199	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2021 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3161	4800	No

v_3 or v_{av34} = 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 2021 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	3161	4600	No

Level of Service Determination (if not F)

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

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

Speed Estimation

Intermediate speed variable,	M_S = 0.278	
Space mean speed in ramp influence area,	S_R = 65.8	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 65.8	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.65

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	6/30/2016
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 EB
Junction:	US176 EB On-Ramp
Jurisdiction:	
Analysis Year:	2020 No-Build
Description:	S-48 IMR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	2269	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	25.0	mph
Volume on ramp	875	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	230	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	900	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2269	875	230	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	630	243	64	v
Trucks and buses	14	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	1.5	
Recreational vehicle PCE, ER	2.0	2.0	1.2	

Heavy vehicle adjustment, fHV	0.826	0.971	0.990	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3051	1001	258	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM}) =$ 3051 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4052	4800	No

v_3 or v_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 3051 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	4052	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ = 27.2 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.470	
Space mean speed in ramp influence area,	S_R = 59.5	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 59.5	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.65

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	6/30/2016
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 WB
Junction:	US 176 WB On-Ramp
Jurisdiction:	
Analysis Year:	2020 No-Build
Description:	S-48 IMR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	2380	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	25.0	mph
Volume on ramp	143	vph
Length of first accel/decel lane	1425	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	1410	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	775	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2380	143	1410	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	661	40	392	v
Trucks and buses	13	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.837	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3160	164	1614	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 3160 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3324	4800	No

v_3 or v_{av34} = 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 3160 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	3324	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ = 22.4 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 0.358

Space mean speed in ramp influence area, S_R = 63.2 mph

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

Space mean speed for all vehicles, S = 63.2 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.65

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	6/30/2016
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 WB
Junction:	S-48 WB On-Ramp
Jurisdiction:	
Analysis Year:	2020 No-Build
Description:	S-48 IMR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	1323	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	196	vph
Length of first accel/decel lane	1225	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	1200	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1475	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1323	196	1200	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	368	54	333	v
Trucks and buses	13	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.837	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1757	224	1373	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM}) =$ 1757 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1981	4800	No

v_3 or v_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 1757 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	1981	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A =$ 13.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.239	
Space mean speed in ramp influence area,	S_R = 67.1	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 67.1	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.65

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	6/30/2016
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 WB
Junction:	SC-202 WB On-Ramp
Jurisdiction:	
Analysis Year:	2020 No-Build
Description:	S-48 IMR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	1405	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	54	vph
Length of first accel/decel lane	525	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	114	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1405	54	114	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	390	15	32	v
Trucks and buses	13	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.837	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1866	62	130	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1866 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	1928	4800	No

v_3 or v_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 1866 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	1928	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ = 17.2 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.301	
Space mean speed in ramp influence area,	S_R = 65.1	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 65.1	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	7/1/2016
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 EB
Junction:	SC 202 EB Off-Ramp
Jurisdiction:	
Analysis Year:	2020 No-Build
Description:	S-48 IMR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	1385	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	38	vph
Length of first accel/decel lane	400	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	199	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1050	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1385	38	199	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	385	11	55	v
Trucks and buses	16	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.806	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1908	43	228	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1908 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1908	4800	No
$v_{FO} = v_F - v_R$	1865	4800	No
v_R	43	2100	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 1908 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1908	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, L_{12}$ = 17.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	D_S = 0.302	
Space mean speed in ramp influence area,	S_R = 65.0	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 65.0	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.65

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	7/1/2016
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 EB
Junction:	S-48 EB Off-Ramp
Jurisdiction:	
Analysis Year:	2020 No-Build
Description:	S-48 IMR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	1546	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	164	vph
Length of first accel/decel lane	975	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1093	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1725	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1546	164	1093	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	429	46	304	v
Trucks and buses	16	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.806	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2130	188	1251	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2130 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2130	4800	No
$v_{FO} = v_F - v_R$	1942	4800	No
v_R	188	2100	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 2130 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2130	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, L_{12}$ = 13.8 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.315

Space mean speed in ramp influence area, S_R = 64.6 mph

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

Space mean speed for all vehicles, S = 64.6 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.65

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	7/1/2016
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 EB
Junction:	US 176 EB Off-Ramp
Jurisdiction:	
Analysis Year:	2020 No-Build
Description:	S-48 IMR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	2475	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	121	vph
Length of first accel/decel lane	1000	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1555	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	900	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2475	121	1555	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	688	34	432	v
Trucks and buses	16	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.806	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3410	138	1780	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3410 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3410	4800	No
$v_{FO} = v_F - v_R$	3272	4800	No
v_R	138	2100	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 3410 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3410	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, L_D$ = 24.6 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.310

Space mean speed in ramp influence area, S_R = 64.8 mph

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

Space mean speed for all vehicles, S = 64.8 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.65

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	7/1/2016
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 WB
Junction:	US 176 WB Off-Ramp
Jurisdiction:	
Analysis Year:	2020 No-Build
Description:	S-48 IMR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	2015	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	482	vph
Length of first accel/decel lane	1225	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	180	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	775	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2015	482	180	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	560	134	50	v
Trucks and buses	23	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.743	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3011	552	206	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3011 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3011	4800	No
$v_{FO} = v_F - v_R$	2459	4800	No
v_R	552	2100	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 3011 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3011	4400	No

Level of Service Determination (if not F)

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

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

Speed Estimation

Intermediate speed variable, D_S = 0.348

Space mean speed in ramp influence area, S_R = 63.5 mph

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

Space mean speed for all vehicles, S = 63.5 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.65

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	7/1/2016
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 WB
Junction:	S-48 WB Off-Ramp
Jurisdiction:	
Analysis Year:	2020 No-Build
Description:	S-48 IMR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	1713	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	850	vph
Length of first accel/decel lane	1225	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	141	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1475	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1713	850	141	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	476	236	39	v
Trucks and buses	23	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.743	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2560	973	161	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2560 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2560	4800	No
$v_{FO} = v_F - v_R$	1587	4800	No
v_R	973	2100	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 2560 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2560	4400	No

Level of Service Determination (if not F)

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

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

Speed Estimation

Intermediate speed variable, D_S = 0.386

Space mean speed in ramp influence area, S_R = 62.3 mph

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

Space mean speed for all vehicles, S = 62.3 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.65

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	7/1/2016
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 WB
Junction:	SC 202 WB Off-Ramp
Jurisdiction:	
Analysis Year:	2020 No-Build
Description:	S-48 IMR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	1004	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	25.0	mph
Volume on ramp	27	vph
Length of first accel/decel lane	400	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	70	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1004	27	70	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	279	8	19	v
Trucks and buses	23	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.743	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1500	31	80	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1500 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1500	4800	No
$v_{FO} = v_F - v_R$	1469	4800	No
v_R	31	1900	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12}/2 No

If yes, v_{12A} = 1500 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1500	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_R - 0.009 L_D$ = 13.6 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.561

Space mean speed in ramp influence area, S_R = 56.5 mph

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

Space mean speed for all vehicles, S = 56.5 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.65

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	7/1/2016
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 EB
Junction:	SC 202 EB Off-Ramp
Jurisdiction:	
Analysis Year:	2020 No-Build
Description:	S-48 IMR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	1714	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	74	vph
Length of first accel/decel lane	400	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	37	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1050	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1714	74	37	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	476	21	10	v
Trucks and buses	14	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.826	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2304	85	42	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2304 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2304	4800	No
$v_{FO} = v_F - v_R$	2219	4800	No
v_R	85	2100	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 2304 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2304	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, L_D$ = 20.5 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	D_S = 0.306	
Space mean speed in ramp influence area,	S_R = 64.9	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 64.9	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.65

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	7/1/2016
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 EB
Junction:	S-48 EB Off-Ramp
Jurisdiction:	
Analysis Year:	2020 No-Build
Description:	S-48 IMR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	1677	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	174	vph
Length of first accel/decel lane	975	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	996	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1725	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1677	174	996	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	466	48	277	v
Trucks and buses	14	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.826	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2255	199	1140	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2255 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2255	4800	No
$v_{FO} = v_F - v_R$	2056	4800	No
v_R	199	2100	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 2255 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2255	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, L_{12}$ = 14.9 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.316

Space mean speed in ramp influence area, S_R = 64.6 mph

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

Space mean speed for all vehicles, S = 64.6 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.65

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	7/1/2016
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 EB
Junction:	US 176 EB Off-Ramp
Jurisdiction:	
Analysis Year:	2020 No-Build
Description:	S-48 IMR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	2499	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	230	vph
Length of first accel/decel lane	1000	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	875	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	900	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2499	230	875	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	694	64	243	v
Trucks and buses	14	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.826	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3360	263	1001	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3360 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3360	4800	No
$v_{FO} = v_F - v_R$	3097	4800	No
v_R	263	2100	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 3360 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3360	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, L_D$ = 24.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.322

Space mean speed in ramp influence area, S_R = 64.4 mph

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

Space mean speed for all vehicles, S = 64.4 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.65

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	7/1/2016
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 WB
Junction:	US 176 WB Off-Ramp
Jurisdiction:	
Analysis Year:	2020 No-Build
Description:	S-48 IMR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	3790	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	1410	vph
Length of first accel/decel lane	1225	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	143	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	775	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3790	1410	143	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	1053	392	40	v
Trucks and buses	13	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.837	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	5032	1614	164	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 5032 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	5032	4800	Yes
$v_{FO} = v_F - v_R$	3418	4800	No
v_R	1614	2100	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 5032 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	5032	4400	Yes

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 36.5 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.443

Space mean speed in ramp influence area, S_R = 60.4 mph

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

Space mean speed for all vehicles, S = 60.4 mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	7/1/2016
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 WB
Junction:	S-48 WB Off-Ramp
Jurisdiction:	
Analysis Year:	2020 No-Build
Description:	S-48 IMR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	2523	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	1200	vph
Length of first accel/decel lane	1225	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	196	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1475	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2523	1200	196	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	701	333	54	v
Trucks and buses	13	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.837	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3350	1373	224	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3350 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3350	4800	No
$v_{FO} = v_F - v_R$	1977	4800	No
v_R	1373	2100	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 3350 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3350	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, L_{12}$ = 22.0 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.422

Space mean speed in ramp influence area, S_R = 61.1 mph

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

Space mean speed for all vehicles, S = 61.1 mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	7/1/2016
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 WB
Junction:	SC 202 WB Off-Ramp
Jurisdiction:	
Analysis Year:	2020 No-Build
Description:	S-48 IMR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	1519	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	25.0	mph
Volume on ramp	114	vph
Length of first accel/decel lane	400	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	54	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1519	114	54	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	422	32	15	v
Trucks and buses	13	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.837	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2017	130	62	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2017 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2017	4800	No
$v_{FO} = v_F - v_R$	1887	4800	No
v_R	130	1900	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 2017 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2017	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_R - 0.009 L_D$ = 18.0 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.570

Space mean speed in ramp influence area, S_R = 56.2 mph

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

Space mean speed for all vehicles, S = 56.2 mph

APPENDIX I

NO-BUILD 2040 HCS REPORTS

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AECOM
Agency or Company:	AECOM
Date Performed:	6/30/2016
Analysis Time Period:	AM Peak
Freeway/Direction:	I-26 EB
From/To:	West of SC 202
Jurisdiction:	
Analysis Year:	2040 No-Build
Description:	S-48 IMR

Flow Inputs and Adjustments

Volume, V	2003	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	556	v
Trucks and buses	16	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.806	
Driver population factor, fp	1.00	
Flow rate, vp	1380	pc/h/ln

Speed Inputs and Adjustments

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

LOS and Performance Measures

Flow rate, vp	1380	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	73.4	mi/h
Number of lanes, N	2	
Density, D	18.8	pc/mi/ln
Level of service, LOS	C	

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AECOM
Agency or Company:	AECOM
Date Performed:	6/30/2016
Analysis Time Period:	AM Peak
Freeway/Direction:	I-26 EB
From/To:	Between S-48 and SC 202
Jurisdiction:	
Analysis Year:	2040 No-Build
Description:	S-48 IMR

Flow Inputs and Adjustments

Volume, V	2202	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	612	v
Trucks and buses	16	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.806	
Driver population factor, fp	1.00	
Flow rate, vp	1517	pc/h/ln

Speed Inputs and Adjustments

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

LOS and Performance Measures

Flow rate, vp	1517	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	72.0	mi/h
Number of lanes, N	2	
Density, D	21.1	pc/mi/ln
Level of service, LOS	C	

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AECOM
Agency or Company:	AECOM
Date Performed:	6/30/2016
Analysis Time Period:	AM Peak
Freeway/Direction:	I-26 EB
From/To:	Between S-48 and US 176
Jurisdiction:	
Analysis Year:	2040 No-Build
Description:	S-48 IMR

Flow Inputs and Adjustments

Volume, V	3396	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	943	v
Trucks and buses	16	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.806	
Driver population factor, fp	1.00	
Flow rate, vp	2339	pc/h/ln

Speed Inputs and Adjustments

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

LOS and Performance Measures

Flow rate, vp	2339	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	55.2	mi/h
Number of lanes, N	2	
Density, D	42.4	pc/mi/ln
Level of service, LOS	E	

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AECOM
Agency or Company:	AECOM
Date Performed:	6/30/2016
Analysis Time Period:	AM Peak
Freeway/Direction:	I-26 EB
From/To:	East of US176
Jurisdiction:	
Analysis Year:	2040 No-Build
Description:	S-48 IMR

Flow Inputs and Adjustments

Volume, V	5164	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1434	v
Trucks and buses	16	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.806	
Driver population factor, fp	1.00	
Flow rate, vp	3557	pc/h/ln

Speed Inputs and Adjustments

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

LOS and Performance Measures

Flow rate, vp	3557	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	2.6	mi/h
Number of lanes, N	2	
Density, D	1356.8	pc/mi/ln
Level of service, LOS	F	

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AECOM
Agency or Company:	AECOM
Date Performed:	6/30/2016
Analysis Time Period:	AM Peak
Freeway/Direction:	I-26 WB
From/To:	East of US 176
Jurisdiction:	
Analysis Year:	2040 No-Build
Description:	S-48 IMR

Flow Inputs and Adjustments

Volume, V	2790	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	775	v
Trucks and buses	23	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.743	
Driver population factor, fp	1.00	
Flow rate, vp	2085	pc/h/ln

Speed Inputs and Adjustments

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

LOS and Performance Measures

Flow rate, vp	2085	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	62.0	mi/h
Number of lanes, N	2	
Density, D	33.6	pc/mi/ln
Level of service, LOS	D	

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AECOM
Agency or Company:	AECOM
Date Performed:	6/30/2016
Analysis Time Period:	AM Peak
Freeway/Direction:	I-26 WB
From/To:	Between S-48 and US 176
Jurisdiction:	
Analysis Year:	2040 No-Build
Description:	S-48 IMR

Flow Inputs and Adjustments

Volume, V	2418	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	672	v
Trucks and buses	23	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.743	
Driver population factor, fp	1.00	
Flow rate, vp	1807	pc/h/ln

Speed Inputs and Adjustments

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

LOS and Performance Measures

Flow rate, vp	1807	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	67.8	mi/h
Number of lanes, N	2	
Density, D	26.7	pc/mi/ln
Level of service, LOS	D	

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AECOM
Agency or Company:	AECOM
Date Performed:	6/30/2016
Analysis Time Period:	AM Peak
Freeway/Direction:	I-26 WB
From/To:	Between S-48 and SC 202
Jurisdiction:	
Analysis Year:	2040 No-Build
Description:	S-48 IMR

Flow Inputs and Adjustments

Volume, V	1414	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	393	v
Trucks and buses	23	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.743	
Driver population factor, fp	1.00	
Flow rate, vp	1057	pc/h/ln

Speed Inputs and Adjustments

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

LOS and Performance Measures

Flow rate, vp	1057	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	75.0	mi/h
Number of lanes, N	2	
Density, D	14.1	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:	AECOM
Agency or Company:	AECOM
Date Performed:	6/30/2016
Analysis Time Period:	AM Peak
Freeway/Direction:	I-26 WB
From/To:	West of SC 202
Jurisdiction:	
Analysis Year:	2040 No-Build
Description:	S-48 IMR

Flow Inputs and Adjustments

Volume, V	1467	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	408	v
Trucks and buses	23	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.743	
Driver population factor, fp	1.00	
Flow rate, vp	1096	pc/h/ln

Speed Inputs and Adjustments

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

LOS and Performance Measures

Flow rate, vp	1096	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	74.9	mi/h
Number of lanes, N	2	
Density, D	14.6	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:	AECOM
Agency or Company:	AECOM
Date Performed:	6/30/2016
Analysis Time Period:	PM Peak
Freeway/Direction:	I-26 EB
From/To:	West of SC 202
Jurisdiction:	
Analysis Year:	2040 No-Build
Description:	S-48 IMR

Flow Inputs and Adjustments

Volume, V	2415	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	671	v
Trucks and buses	14	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.826	
Driver population factor, fp	1.00	
Flow rate, vp	1623	pc/h/ln

Speed Inputs and Adjustments

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

LOS and Performance Measures

Flow rate, vp	1623	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	70.7	mi/h
Number of lanes, N	2	
Density, D	23.0	pc/mi/ln
Level of service, LOS	C	

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AECOM
Agency or Company:	AECOM
Date Performed:	6/30/2016
Analysis Time Period:	PM Peak
Freeway/Direction:	I-26 EB
From/To:	Between S-48 and SC 202
Jurisdiction:	
Analysis Year:	2040 No-Build
Description:	S-48 IMR

Flow Inputs and Adjustments

Volume, V	2370	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	658	v
Trucks and buses	14	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.826	
Driver population factor, fp	1.00	
Flow rate, vp	1593	pc/h/ln

Speed Inputs and Adjustments

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

LOS and Performance Measures

Flow rate, vp	1593	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	71.1	mi/h
Number of lanes, N	2	
Density, D	22.4	pc/mi/ln
Level of service, LOS	C	

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AECOM
Agency or Company:	AECOM
Date Performed:	6/30/2016
Analysis Time Period:	PM Peak
Freeway/Direction:	I-26 EB
From/To:	Between S-48 and US 176
Jurisdiction:	
Analysis Year:	2040 No-Build
Description:	S-48 IMR

Flow Inputs and Adjustments

Volume, V	3502	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	973	v
Trucks and buses	14	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.826	
Driver population factor, fp	1.00	
Flow rate, vp	2354	pc/h/ln

Speed Inputs and Adjustments

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

LOS and Performance Measures

Flow rate, vp	2354	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	54.7	mi/h
Number of lanes, N	2	
Density, D	43.0	pc/mi/ln
Level of service, LOS	E	

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AECOM
Agency or Company:	AECOM
Date Performed:	6/30/2016
Analysis Time Period:	PM Peak
Freeway/Direction:	I-26 EB
From/To:	East of US176
Jurisdiction:	
Analysis Year:	2040 No-Build
Description:	S-48 IMR

Flow Inputs and Adjustments

Volume, V	4257	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1183	v
Trucks and buses	14	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.826	
Driver population factor, fp	1.00	
Flow rate, vp	2862	pc/h/ln

Speed Inputs and Adjustments

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

LOS and Performance Measures

Flow rate, vp	2862	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	36.6	mi/h
Number of lanes, N	2	
Density, D	78.2	pc/mi/ln
Level of service, LOS	F	

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AECOM
Agency or Company:	AECOM
Date Performed:	6/30/2016
Analysis Time Period:	PM Peak
Freeway/Direction:	I-26 WB
From/To:	East of US 176
Jurisdiction:	
Analysis Year:	2040 No-Build
Description:	S-48 IMR

Flow Inputs and Adjustments

Volume, V	5028	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	1397	v
Trucks and buses	13	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.837	
Driver population factor, fp	1.00	
Flow rate, vp	3338	pc/h/ln

Speed Inputs and Adjustments

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

LOS and Performance Measures

Flow rate, vp	3338	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	14.5	mi/h
Number of lanes, N	2	
Density, D	230.4	pc/mi/ln
Level of service, LOS	F	

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AECOM
Agency or Company:	AECOM
Date Performed:	6/30/2016
Analysis Time Period:	PM Peak
Freeway/Direction:	I-26 WB
From/To:	Between S-48 and US 176
Jurisdiction:	
Analysis Year:	2040 No-Build
Description:	S-48 IMR

Flow Inputs and Adjustments

Volume, V	3467	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	963	v
Trucks and buses	13	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.837	
Driver population factor, fp	1.00	
Flow rate, vp	2302	pc/h/ln

Speed Inputs and Adjustments

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

LOS and Performance Measures

Flow rate, vp	2302	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	56.2	mi/h
Number of lanes, N	2	
Density, D	40.9	pc/mi/ln
Level of service, LOS	E	

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AECOM
Agency or Company:	AECOM
Date Performed:	6/30/2016
Analysis Time Period:	PM Peak
Freeway/Direction:	I-26 WB
From/To:	Between S-48 and SC 202
Jurisdiction:	
Analysis Year:	2040 No-Build
Description:	S-48 IMR

Flow Inputs and Adjustments

Volume, V	2158	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	599	v
Trucks and buses	13	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.837	
Driver population factor, fp	1.00	
Flow rate, vp	1433	pc/h/ln

Speed Inputs and Adjustments

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

LOS and Performance Measures

Flow rate, vp	1433	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	72.9	mi/h
Number of lanes, N	2	
Density, D	19.7	pc/mi/ln
Level of service, LOS	C	

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

Phone: Fax:
E-mail:

Operational Analysis

Analyst:	AECOM
Agency or Company:	AECOM
Date Performed:	6/30/2016
Analysis Time Period:	PM Peak
Freeway/Direction:	I-26 WB
From/To:	West of SC 202
Jurisdiction:	
Analysis Year:	2040 No-Build
Description:	S-48 IMR

Flow Inputs and Adjustments

Volume, V	2084	veh/h
Peak-hour factor, PHF	0.90	
Peak 15-min volume, v15	579	v
Trucks and buses	13	%
Recreational vehicles	0	%
Terrain type:	Rolling	
Grade	-	%
Segment length	-	mi
Trucks and buses PCE, ET	2.5	
Recreational vehicle PCE, ER	2.0	
Heavy vehicle adjustment, fHV	0.837	
Driver population factor, fp	1.00	
Flow rate, vp	1384	pc/h/ln

Speed Inputs and Adjustments

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

LOS and Performance Measures

Flow rate, vp	1384	pc/h/ln
Free-flow speed, FFS	74.1	mi/h
Average passenger-car speed, S	73.4	mi/h
Number of lanes, N	2	
Density, D	18.9	pc/mi/ln
Level of service, LOS	C	

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

HCS 2010: Freeway Merge and Diverge Segments Release 6.65

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	6/30/2016
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 EB
Junction:	SC-202 EB On-Ramp
Jurisdiction:	
Analysis Year:	2040 No-Build
Description:	S-48 IMR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	1957	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	25.0	mph
Volume on ramp	245	vph
Length of first accel/decel lane	400	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	46	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1050	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1957	245	46	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	544	68	13	v
Trucks and buses	16	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.806	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2696	280	53	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2696 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2976	4800	No

v_3 or v_{av34} = 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 2696 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2976	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ = 26.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.377	
Space mean speed in ramp influence area,	S_R = 62.5	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 62.5	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.65

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	6/30/2016
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 EB
Junction:	S-48 EB On-Ramp
Jurisdiction:	
Analysis Year:	2040 No-Build
Description:	S-48 IMR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	1979	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	1417	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	223	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1725	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1979	1417	223	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	550	394	62	v
Trucks and buses	16	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.806	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2727	1622	255	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2727 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4349	4800	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 2727 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	4349	4600	No

Level of Service Determination (if not F)

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

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

Speed Estimation

Intermediate speed variable,	M_S = 0.488	
Space mean speed in ramp influence area,	S_R = 58.9	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 58.9	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.65

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	6/30/2016
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 EB
Junction:	US176 EB On-Ramp
Jurisdiction:	
Analysis Year:	2040 No-Build
Description:	S-48 IMR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	3248	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	25.0	mph
Volume on ramp	1916	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	148	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	900	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3248	1916	148	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	902	532	41	v
Trucks and buses	16	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	1.5	
Recreational vehicle PCE, ER	2.0	2.0	1.2	

Heavy vehicle adjustment, fHV	0.806	0.971	0.990	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	4475	2193	166	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 4475 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	6668	4800	Yes

v_3 or v_{av34} = 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 4475 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	6668	4600	Yes

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ = 47.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, M_S = 3.315

Space mean speed in ramp influence area, S_R = -34.4 mph

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

Space mean speed for all vehicles, S = mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.65

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	6/30/2016
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 WB
Junction:	US 176 WB On-Ramp
Jurisdiction:	
Analysis Year:	2040 No-Build
Description:	S-48 IMR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	2196	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	25.0	mph
Volume on ramp	222	vph
Length of first accel/decel lane	1425	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	594	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	775	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2196	222	594	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	610	62	165	v
Trucks and buses	23	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.743	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3282	254	680	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM}) =$ 3282 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3536	4800	No

v_3 or v_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12}/2 No

If yes, v_{12A} = 3282 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	3536	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 24.0 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.384	
Space mean speed in ramp influence area,	S_R = 62.3	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 62.3	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.65

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	6/30/2016
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 WB
Junction:	S-48 WB On-Ramp
Jurisdiction:	
Analysis Year:	2040 No-Build
Description:	S-48 IMR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	1230	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	184	vph
Length of first accel/decel lane	1225	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	1188	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1475	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1230	184	1188	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	342	51	330	v
Trucks and buses	23	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.743	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1838	211	1360	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 1838 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2049	4800	No

v_3 or v_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 1838 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2049	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ = 13.7 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.241	
Space mean speed in ramp influence area,	S_R = 67.0	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 67.0	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.65

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	6/30/2016
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 WB
Junction:	SC-202 WB On-Ramp
Jurisdiction:	
Analysis Year:	2040 No-Build
Description:	S-48 IMR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	1381	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	86	vph
Length of first accel/decel lane	525	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	33	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1381	86	33	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	384	24	9	v
Trucks and buses	23	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.743	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2064	98	38	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2064 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2162	4800	No

v_3 or v_{av34} = 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 2064 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2162	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ = 19.0 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.308	
Space mean speed in ramp influence area,	S_R = 64.8	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 64.8	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.65

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	6/30/2016
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 EB
Junction:	SC-202 EB On-Ramp
Jurisdiction:	
Analysis Year:	2040 No-Build
Description:	S-48 IMR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	2325	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	25.0	mph
Volume on ramp	45	vph
Length of first accel/decel lane	400	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	90	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1050	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2325	45	90	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	646	13	25	v
Trucks and buses	14	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.826	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3126	52	103	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM}) =$ 3126 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3178	4800	No

v_3 or v_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 3126 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	3178	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 27.7 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.395	
Space mean speed in ramp influence area,	S_R = 62.0	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 62.0	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.65

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	6/30/2016
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 EB
Junction:	S-48 EB On-Ramp
Jurisdiction:	
Analysis Year:	2040 No-Build
Description:	S-48 IMR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	2140	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	1362	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	230	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1725	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2140	1362	230	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	594	378	64	v
Trucks and buses	14	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.826	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2877	1559	263	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2877 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4436	4800	No

v_3 or v_{av34} = 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12}/2 No

If yes, v_{12A} = 2877 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	4436	4600	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ = 30.0 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.515	
Space mean speed in ramp influence area,	S_R = 58.0	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 58.0	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.65

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	6/30/2016
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 EB
Junction:	US176 EB On-Ramp
Jurisdiction:	
Analysis Year:	2040 No-Build
Description:	S-48 IMR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	3218	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	25.0	mph
Volume on ramp	1079	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	284	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	900	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3218	1079	284	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	894	300	79	v
Trucks and buses	14	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	1.5	
Recreational vehicle PCE, ER	2.0	2.0	1.2	

Heavy vehicle adjustment, fHV	0.826	0.971	0.990	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	4326	1235	319	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 4326 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	5561	4800	Yes

v_3 or v_{av34} = 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 4326 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	5561	4600	Yes

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ = 38.9 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 1.260	
Space mean speed in ramp influence area,	S_R = 33.4	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 33.4	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.65

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	6/30/2016
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 WB
Junction:	US 176 WB On-Ramp
Jurisdiction:	
Analysis Year:	2040 No-Build
Description:	S-48 IMR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	3290	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	25.0	mph
Volume on ramp	177	vph
Length of first accel/decel lane	1425	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	1738	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	775	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3290	177	1738	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	914	49	483	v
Trucks and buses	13	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.837	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	4368	203	1989	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 4368 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4571	4800	No

v_3 or v_{av34} = 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12}/2 No

If yes, v_{12A} = 4368 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	4571	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ = 32.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.627	
Space mean speed in ramp influence area,	S_R = 54.3	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 54.3	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.65

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	6/30/2016
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 WB
Junction:	S-48 WB On-Ramp
Jurisdiction:	
Analysis Year:	2040 No-Build
Description:	S-48 IMR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	1891	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	267	vph
Length of first accel/decel lane	1225	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	1576	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1475	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1891	267	1576	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	525	74	438	v
Trucks and buses	13	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.837	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2511	306	1804	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2511 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2817	4800	No

v_3 or v_{av34} = 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 2511 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2817	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ = 19.6 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.276	
Space mean speed in ramp influence area,	S_R = 65.9	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 65.9	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.65

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	6/30/2016
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 WB
Junction:	SC-202 WB On-Ramp
Jurisdiction:	
Analysis Year:	2040 No-Build
Description:	S-48 IMR

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	2018	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	66	vph
Length of first accel/decel lane	525	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	140	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2018	66	140	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	561	18	39	v
Trucks and buses	13	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.837	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2679	76	160	pcph

Estimation of V12 Merge Areas

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

P_{FM} = 1.000 Using Equation 0

$v_{12} = v_F (P_{FM})$ = 2679 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2755	4800	No

v_3 or v_{av34} = 0 pc/h (Equation 13-14 or 13-17)

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 2679 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	2755	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ = 23.6 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	M_S = 0.335	
Space mean speed in ramp influence area,	S_R = 63.9	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 63.9	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.65

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	7/1/2016
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 EB
Junction:	SC 202 EB Off-Ramp
Jurisdiction:	
Analysis Year:	2040 No-Build
Description:	S-48 IMR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	2003	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	46	vph
Length of first accel/decel lane	400	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	245	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1050	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2003	46	245	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	556	13	68	v
Trucks and buses	16	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.806	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2760	53	280	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2760 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2760	4800	No
$v_{FO} = v_F - v_R$	2707	4800	No
v_R	53	2100	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 2760 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2760	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_R - 0.009 L_{12}$ = 24.4 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.303

Space mean speed in ramp influence area, S_R = 65.0 mph

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

Space mean speed for all vehicles, S = 65.0 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.65

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	7/1/2016
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 EB
Junction:	S-48 EB Off-Ramp
Jurisdiction:	
Analysis Year:	2040 No-Build
Description:	S-48 IMR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	2202	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	223	vph
Length of first accel/decel lane	975	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1417	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1725	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2202	223	1417	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	612	62	394	v
Trucks and buses	16	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.806	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3034	255	1622	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3034 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3034	4800	No
$v_{FO} = v_F - v_R$	2779	4800	No
v_R	255	2100	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 3034 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3034	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_R - 0.009 L_D$ = 21.6 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.321

Space mean speed in ramp influence area, S_R = 64.4 mph

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

Space mean speed for all vehicles, S = 64.4 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.65

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	7/1/2016
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 EB
Junction:	US 176 EB Off-Ramp
Jurisdiction:	
Analysis Year:	2040 No-Build
Description:	S-48 IMR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	3396	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	148	vph
Length of first accel/decel lane	1000	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1916	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	900	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3396	148	1916	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	943	41	532	v
Trucks and buses	16	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.806	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	4679	169	2193	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 4679 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4679	4800	No
$v_{FO} = v_F - v_R$	4510	4800	No
v_R	169	2100	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 4679 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	4679	4400	Yes

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ = 35.5 pc/mi/ln

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

Speed Estimation

Intermediate speed variable,	D_S = 0.313	
Space mean speed in ramp influence area,	S_R = 64.7	mph
Space mean speed in outer lanes,	S_0 = N/A	mph
Space mean speed for all vehicles,	S = 64.7	mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.65

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	7/1/2016
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 WB
Junction:	US 176 WB Off-Ramp
Jurisdiction:	
Analysis Year:	2040 No-Build
Description:	S-48 IMR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	2790	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	594	vph
Length of first accel/decel lane	1225	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	222	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	775	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp		
Volume, V (vph)	2790		594		222		vph
Peak-hour factor, PHF	0.90		0.90		0.90		
Peak 15-min volume, v15	775		165		62		v
Trucks and buses	23		2		2		%
Recreational vehicles	0		0		0		%
Terrain type:	Rolling		Rolling		Rolling		
Grade	0.00	%	0.00	%	0.00	%	
Length	0.00	mi	0.00	mi	0.00	mi	
Trucks and buses PCE, ET	2.5		2.5		2.5		
Recreational vehicle PCE, ER	2.0		2.0		2.0		

Heavy vehicle adjustment, fHV	0.743	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	4169	680	254	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 4169 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4169	4800	No
$v_{FO} = v_F - v_R$	3489	4800	No
v_R	680	2100	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 4169 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	4169	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_R - 0.009 L_{12}$ = 29.1 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.359

Space mean speed in ramp influence area, S_R = 63.1 mph

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

Space mean speed for all vehicles, S = 63.1 mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	7/1/2016
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 WB
Junction:	S-48 WB Off-Ramp
Jurisdiction:	
Analysis Year:	2040 No-Build
Description:	S-48 IMR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	2418	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	1188	vph
Length of first accel/decel lane	1225	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	184	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1475	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2418	1188	184	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	672	330	51	v
Trucks and buses	23	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.743	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3614	1360	211	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3614 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3614	4800	No
$v_{FO} = v_F - v_R$	2254	4800	No
v_R	1360	2100	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 3614 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3614	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_R - 0.009 L_{12}$ = 24.3 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.420

Space mean speed in ramp influence area, S_R = 61.1 mph

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

Space mean speed for all vehicles, S = 61.1 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.65

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	7/1/2016
Analysis time period:	AM Peak
Freeway/Dir of Travel:	I-26 WB
Junction:	SC 202 WB Off-Ramp
Jurisdiction:	
Analysis Year:	2040 No-Build
Description:	S-48 IMR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	1414	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	25.0	mph
Volume on ramp	33	vph
Length of first accel/decel lane	400	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	86	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1414	33	86	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	393	9	24	v
Trucks and buses	23	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.743	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2113	38	98	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2113 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2113	4800	No
$v_{FO} = v_F - v_R$	2075	4800	No
v_R	38	1900	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 2113 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2113	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, L_{12}$ = 18.8 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.561

Space mean speed in ramp influence area, S_R = 56.5 mph

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

Space mean speed for all vehicles, S = 56.5 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.65

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	7/1/2016
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 EB
Junction:	SC 202 EB Off-Ramp
Jurisdiction:	
Analysis Year:	2040 No-Build
Description:	S-48 IMR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	2415	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	90	vph
Length of first accel/decel lane	400	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	45	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1050	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2415	90	45	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	671	25	13	v
Trucks and buses	14	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.826	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3247	103	52	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3247 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3247	4800	No
$v_{FO} = v_F - v_R$	3144	4800	No
v_R	103	2100	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 3247 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3247	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, L_{12}$ = 28.6 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.307

Space mean speed in ramp influence area, S_R = 64.9 mph

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

Space mean speed for all vehicles, S = 64.9 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.65

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	7/1/2016
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 EB
Junction:	S-48 EB Off-Ramp
Jurisdiction:	
Analysis Year:	2040 No-Build
Description:	S-48 IMR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	2370	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	230	vph
Length of first accel/decel lane	975	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1362	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1725	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2370	230	1362	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	658	64	378	v
Trucks and buses	14	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.826	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3186	263	1559	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3186 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3186	4800	No
$v_{FO} = v_F - v_R$	2923	4800	No
v_R	263	2100	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 3186 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3186	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, L_D$ = 22.9 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.322

Space mean speed in ramp influence area, S_R = 64.4 mph

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

Space mean speed for all vehicles, S = 64.4 mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	7/1/2016
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 EB
Junction:	US 176 EB Off-Ramp
Jurisdiction:	
Analysis Year:	2040 No-Build
Description:	S-48 IMR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	3502	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	284	vph
Length of first accel/decel lane	1000	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1079	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	900	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3502	284	1079	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	973	79	300	v
Trucks and buses	14	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.826	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	4708	325	1235	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 4708 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4708	4800	No
$v_{FO} = v_F - v_R$	4383	4800	No
v_R	325	2100	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 4708 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	4708	4400	Yes

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ = 35.7 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.327

Space mean speed in ramp influence area, S_R = 64.2 mph

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

Space mean speed for all vehicles, S = 64.2 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.65

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	7/1/2016
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 WB
Junction:	US 176 WB Off-Ramp
Jurisdiction:	
Analysis Year:	2040 No-Build
Description:	S-48 IMR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	5028	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	1738	vph
Length of first accel/decel lane	1225	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	177	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	775	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	5028	1738	177	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	1397	483	49	v
Trucks and buses	13	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.837	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	6676	1989	203	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 6676 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	6676	4800	Yes
$v_{FO} = v_F - v_R$	4687	4800	No
v_R	1989	2100	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 6676 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	6676	4400	Yes

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086\, v_R - 0.009\, L_D$ = 50.6 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.477

Space mean speed in ramp influence area, S_R = 59.3 mph

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

Space mean speed for all vehicles, S = 59.3 mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	7/1/2016
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 WB
Junction:	S-48 WB Off-Ramp
Jurisdiction:	
Analysis Year:	2040 No-Build
Description:	S-48 IMR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	3467	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	1576	vph
Length of first accel/decel lane	1225	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	267	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1475	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3467	1576	267	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	963	438	74	v
Trucks and buses	13	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.837	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	4603	1804	306	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 4603 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4603	4800	No
$v_{FO} = v_F - v_R$	2799	4800	No
v_R	1804	2100	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	

Is v_3 or v_{av34} > 2700 pc/h? No

Is v_3 or v_{av34} > 1.5 v_{12} /2 No

If yes, v_{12A} = 4603 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	4603	4400	Yes

Level of Service Determination (if not F)

Density, $D_D = 4.252 + 0.0086 v_R - 0.009 L_{12}$ = 32.8 pc/mi/ln

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

Speed Estimation

Intermediate speed variable, D_S = 0.460

Space mean speed in ramp influence area, S_R = 59.8 mph

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

Space mean speed for all vehicles, S = 59.8 mph

HCS 2010: Freeway Merge and Diverge Segments Release 6.65

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	AECOM
Agency/Co.:	AECOM
Date performed:	7/1/2016
Analysis time period:	PM Peak
Freeway/Dir of Travel:	I-26 WB
Junction:	SC 202 WB Off-Ramp
Jurisdiction:	
Analysis Year:	2040 No-Build
Description:	S-48 IMR

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	75.0	mph
Volume on freeway	2158	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	25.0	mph
Volume on ramp	140	vph
Length of first accel/decel lane	400	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	66	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2158	140	66	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	599	39	18	v
Trucks and buses	13	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Rolling	Rolling	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	2.5	2.5	2.5	
Recreational vehicle PCE, ER	2.0	2.0	2.0	

Heavy vehicle adjustment, fHV	0.837	0.971	0.971	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2865	160	76	pcph

Estimation of V12 Diverge Areas

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

P_{FD} = 1.000 Using Equation 0

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2865 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2865	4800	No
$v_{FO} = v_F - v_R$	2705	4800	No
v_R	160	1900	No
v_3 or v_{av34}	0 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or v_{av34}	> 2700 pc/h?	No	
Is v_3 or v_{av34}	> 1.5 v_{12} /2	No	

If yes, v_{12A} = 2865 (Equation 13-15, 13-16, 13-18, or 13-19)

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2865	4400	No

Level of Service Determination (if not F)

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

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

Speed Estimation

Intermediate speed variable, D_S = 0.572

Space mean speed in ramp influence area, S_R = 56.1 mph

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

Space mean speed for all vehicles, S = 56.1 mph