

Phone: Fax:  
E-mail:

### Merge Analysis

Analyst:  
Agency/Co.: Stantec  
Date performed: 11/10/2016  
Analysis time period: 2:00PM-3:00PM  
Freeway/Dir of Travel: I-85 Northbound  
Junction: SC 5 On Ramp to I-85 NB  
Jurisdiction: SCDOT  
Analysis Year: 2015 Existing Conditions  
Description:

### Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.7	mph
Volume on freeway	2014	vph

### On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	105	vph
Length of first accel/decel lane	1375	ft
Length of second accel/decel lane		ft

### Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	355	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	On	
Distance to adjacent Ramp	3940	ft

### Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2014	105	355	vph
Peak-hour factor, PHF	0.94	0.94	0.94	
Peak 15-min volume, v15	536	28	94	v
Trucks and buses	30	0	0	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	1.5	1.5	
Recreational vehicle PCE, ER	2.0	1.2	1.2	

Heavy vehicle adjustment, fHV	0.690	1.000	1.000	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	3107	112	378	pcph

Estimation of V12 Merge Areas

L

=

(Equation 13-6 or 13-7)

EQ

P

=

1.000

Using Equation

0

FM

v

=

v

(P

)

=

3107

pc/h

12

F

FM

Capacity Checks

		Actual	Maximum	LOS F?
v		3219	4800	No
FO				
v	or v	0	pc/h	(Equation 13-14 or 13-17)
3	av34			
Is	v	or v	> 2700 pc/h?	No
3	av34			
Is	v	or v	> 1.5 v /2	No
3	av34	12		
If yes, v	= 3107		(Equation 13-15, 13-16, 13-18, or 13-19)	
12A				

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v	3219	4600	No
R12			

Level of Service Determination (if not F)

Density, D = 5.475 + 0.00734 v

+ 0.0078 v

- 0.00627 L

=

21.9

pc/mi/ln

R

R

12

A

Level of service for ramp-freeway junction areas of influence

C

Speed Estimation

Intermediate speed variable,	M	=	0.322	
	S			
Space mean speed in ramp influence area,	S	=	61.5	mph
	R			
Space mean speed in outer lanes,	S	=	N/A	mph
	0			
Space mean speed for all vehicles,	S	=	61.5	mph