

Florence & Hutcheson
501 Huger Street
Columbia, SC 29201

Phone: (803)254-5800
E-mail:

Fax: (803)929-0334

_____Merge Analysis_____

Analyst: JP
Agency/Co.: Florence & Hutcheson
Date performed: 9/23/2011
Analysis time period: PM
Freeway/Dir of Travel: I-385 SB
Junction: Roper Mtn Rd
Jurisdiction: Greenville, SC
Analysis Year: 2015
Description: I-85/I-385 Alternate 4A

_____Freeway Data_____

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	60.0	mph
Volume on freeway	4686	vph

_____On Ramp Data_____

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	55.0	mph
Volume on ramp	1796	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	883	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2220	ft

_____Conversion to pc/h Under Base Conditions_____

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4686	1796	883	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	1302	499	245	v
Trucks and buses	18	18	18	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	

Heavy vehicle adjustment, fHV	0.917	0.917	0.917	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	5675	2175	1069	pcph

Estimation of V12 Merge Areas

L = 2820.50 (Equation 13-6 or 13-7)

EQ

P = 0.582 Using Equation 2

FM

v = v (P) = 3300 pc/h

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v	7850	6900	Yes
FO			
v or v	2375 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	= 3300	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v	7850	4600	Yes
R12			

Level of Service Determination (if not F)

Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 37.8 pc/mi/ln

R R 12 A

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

Speed Estimation

Intermediate speed variable,	M = 1.087	
	S	
Space mean speed in ramp influence area,	S = 40.4	mph
	R	
Space mean speed in outer lanes,	S = 53.0	mph
	0	
Space mean speed for all vehicles,	S = 43.6	mph