

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: 8/9/2011  
Analysis time period: PM  
Freeway/Dir of Travel: I-85 SB  
Junction: Pelham Rd  
Jurisdiction: Greenville, SC  
Analysis Year: 2035  
Description: I-85/I-385 Alternate 4A

### \_\_\_\_\_Freeway Data\_\_\_\_\_

Type of analysis	Merge	
Number of lanes in freeway	4	
Free-flow speed on freeway	60.0	mph
Volume on freeway	7579	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	1520	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	790	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	On	
Distance to adjacent Ramp	2800	ft

### \_\_\_\_\_Conversion to pc/h Under Base Conditions\_\_\_\_\_

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	7579	1520	790	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	2105	422	219	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	9179	1841	957	pcph

# Estimation of V12 Merge Areas

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

EQ

P = -0.012 Using Equation 4

FM

v = v (P ) = -112 pc/h

12 F FM

# Capacity Checks

	Actual	Maximum	LOS F?
v	11020	9200	Yes
FO			
v or v	4645 pc/h	(Equation 13-14 or 13-17)	
3 av34			
Is v or v	> 2700 pc/h?	Yes	
3 av34			
Is v or v	> 1.5 v /2	Yes	
3 av34	12		
If yes, v	= 3671	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

# Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v	11020	4600	Yes
12A			

# Level of Service Determination (if not F)

Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 38.2 pc/mi/ln

R R 12 A

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

# Speed Estimation

Intermediate speed variable,	M = 1.152	
	S	
Space mean speed in ramp influence area,	S = 39.3	mph
	R	
Space mean speed in outer lanes,	S = 50.7	mph
	0	
Space mean speed for all vehicles,	S = 44.3	mph