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-----Merge Analysis-----

Analyst: JP
Agency/Co.: Florence & Hutcheson
Date performed: 9/23/2011
Analysis time period: PM
Freeway/Dir of Travel: I-85 SB
Junction: US 276
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	6000	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	624	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

-----Adjacent Ramp Data (if one exists)-----

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	493	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	470	ft

-----Conversion to pc/h Under Base Conditions-----

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	6000	624	493	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	1667	173	137	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	7267	756	597	pcph

Estimation of V12 Merge Areas

L = 843.92 (Equation 13-6 or 13-7)

EQ

P = 0.568 Using Equation 2

FM

v = v (P) = 4126 pc/h

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v	8023	6900	Yes
FO			
v or v	3141 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	No	
3 av34	12		
If yes, v	= 4567	(Equation 13-15, 13-16, 13-18, or 13-19)	
12A			

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v	8023	4600	Yes
12A			

Level of Service Determination (if not F)

Density, D = 5.475 + 0.00734 v + 0.0078 v - 0.00627 L = 43.5 pc/mi/ln

R R 12 A

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

Speed Estimation

Intermediate speed variable,	M = 1.095	
	S	
Space mean speed in ramp influence area,	S = 40.3	mph
	R	
Space mean speed in outer lanes,	S = 51.1	mph
	0	
Space mean speed for all vehicles,	S = 43.4	mph