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### \_\_\_\_\_Merge Analysis\_\_\_\_\_

Analyst: NJ  
Agency/Co.: Florence & Hutcheson  
Date performed: 3/28/2011  
Analysis time period: AM  
Freeway/Dir of Travel: I-85 SB  
Junction: Pelham Rd wb on-ramp  
Jurisdiction: Greenville, SC  
Analysis Year: 2010  
Description: I-85/I-385 Existing

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

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	60.0	mph
Volume on freeway	3400	vph

### \_\_\_\_\_On Ramp Data\_\_\_\_\_

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	30.0	mph
Volume on ramp	308	vph
Length of first accel/decel lane	550	ft
Length of second accel/decel lane		ft

### \_\_\_\_\_Adjacent Ramp Data (if one exists)\_\_\_\_\_

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	1334	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	On	
Distance to adjacent Ramp	2760	ft

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

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3400	308	1334	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	944	86	371	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	4118	373	1616	pcph

-----Estimation of V12 Merge Areas-----

$$L = \text{(Equation 13-6 or 13-7)}$$

$$EQ$$

$$P = 0.593 \quad \text{Using Equation 1}$$

$$FM$$

$$v_{12} = v_F(P) = 2442 \quad \text{pc/h}$$

-----Capacity Checks-----

	Actual	Maximum	LOS F?
v <sub>FO</sub>	4491	6900	No
v <sub>3</sub> or v <sub>av34</sub>	1676 pc/h	(Equation 13-14 or 13-17)	
Is v <sub>3</sub> or v <sub>av34</sub> > 2700 pc/h?		No	
Is v <sub>3</sub> or v <sub>av34</sub> > 1.5 v <sub>12</sub> / 2		No	
If yes, v <sub>12A</sub> = 2442		(Equation 13-15, 13-16, 13-18, or 13-19)	

-----Flow Entering Merge Influence Area-----

	Actual	Max Desirable	Violation?
v <sub>R12</sub>	4491	4600	No

-----Level of Service Determination (if not F)-----

$$\text{Density, } D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 23.8 \quad \text{pc/mi/ln}$$

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

-----Speed Estimation-----

Intermediate speed variable,	M	= 0.353	
Space mean speed in ramp influence area,	S <sub>R</sub>	= 53.6	mph
Space mean speed in outer lanes,	S <sub>0</sub>	= 55.8	mph
Space mean speed for all vehicles,	S	= 54.4	mph