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### Diverge Analysis

Analyst: NJ  
Agency/Co.: Florence & Hutcheson  
Date performed: 3/29/2011  
Analysis time period: AM  
Freeway/Dir of Travel: I-385 NB  
Junction: Roper Mtn Rd off-ramp  
Jurisdiction: Greenville, SC  
Analysis Year: 2010  
Description: I-85/I-385 Existing

### Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	4	
Free-flow speed on freeway	60.0	mph
Volume on freeway	4064	vph

### Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	2	
Free-Flow speed on ramp	55.0	mph
Volume on ramp	1350	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane	1500	ft

### Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	382	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1900	ft

### Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4064	1350	382	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	1129	375	106	v
Trucks and buses	18	18	18	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 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	4922	1635	463	pcph

#### Estimation of V12 Diverge Areas

$$L = \text{(Equation 13-12 or 13-13)}$$

EQ

$$P = 0.260 \quad \text{Using Equation 0}$$

FD

$$v_{12} = v_R + (v_F - v_R) P_{FD} = 2490 \quad \text{pc/h}$$

#### Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4922	9200	No
$v_{FO} = v_F - v_R$	3287	9200	No
$v_R$	1635	4400	No
$v_3$ or $v_{av34}$	1216 pc/h	(Equation 13-14 or 13-17)	
Is $v_3$ or $v_{av34} > 2700 \text{ pc/h?}$		No	
Is $v_3$ or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 2490$		(Equation 13-15, 13-16, 13-18, or 13-19)	

#### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
$v_{12}$	2490	4400	No

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

Density,	$D = 4.252 + 0.0086 v_R - 0.009 L_D$	$= -14.8$	pc/mi/ln
Level of service for ramp-freeway junction areas of influence A			

#### Speed Estimation

Intermediate speed variable,	$D_S = 0.315$	
Space mean speed in ramp influence area,	$S_R = 54.3$	mph
Space mean speed in outer lanes,	$S_0 = 65.0$	mph
Space mean speed for all vehicles,	$S = 59.1$	mph