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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: I-85 sb 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	2	
Free-flow speed on freeway	60.0	mph
Volume on freeway	3263	vph

### Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	25.0	mph
Volume on ramp	853	vph
Length of first accel/decel lane	940	ft
Length of second accel/decel lane		ft

### Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	966	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	1800	ft

### Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	3263		853		966	vph
Peak-hour factor, PHF	0.90		0.90		0.90	
Peak 15-min volume, v15	906		237		268	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	3952	1033	1170	pcph

#### Estimation of V12 Diverge Areas

L = (Equation 13-12 or 13-13)

EQ

P = 1.000 Using Equation 0

FD

$v_{12} = v_R + (v_F - v_R) P = 3952 \text{ pc/h}$

#### Capacity Checks

	Actual	Maximum	LOS F?
$v_F = v_{Fi}$	3952	4600	No
$v_F = v_F - v_R$	2919	4600	No
$v_R$	1033	1900	No
$v_3$ or $v_{av34}$	0 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, $v_{12A} = 3952$		(Equation 13-15, 13-16, 13-18, or 13-19)	

#### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
$v_{12}$	3952	4400	No

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

Density,  $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 29.8 \text{ pc/mi/ln}$

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

#### Speed Estimation

Intermediate speed variable,	$D_S = 0.651$	
Space mean speed in ramp influence area,	$S_R = 48.3$	mph
Space mean speed in outer lanes,	$S_0 = \text{N/A}$	mph
Space mean speed for all vehicles,	$S = 48.3$	mph