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### Diverge Analysis

Analyst: NJ  
Agency/Co.: Florence & Hutcheson  
Date performed: 3/29/2011  
Analysis time period: PM  
Freeway/Dir of Travel: I-385 NB  
Junction: I-85 nb 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	3	
Free-flow speed on freeway	60.0	mph
Volume on freeway	4690	vph

### Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	40.0	mph
Volume on ramp	1049	vph
Length of first accel/decel lane	1000	ft
Length of second accel/decel lane		ft

### Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	787	vph
Position of adjacent ramp	Downstream	
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)	4690		1049		787	vph
Peak-hour factor, PHF	0.90		0.90		0.90	
Peak 15-min volume, v15	1303		291		219	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	5680	1270	953	pcph

#### Estimation of V12 Diverge Areas

$$L = 1909.88 \text{ (Equation 13-12 or 13-13)}$$

EQ

$$P = 0.562 \text{ Using Equation 7}$$

FD

$$v_{12} = v_R + (v_F - v_R) P_{FD} = 3750 \text{ pc/h}$$

#### Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	5680	6900	No
$v_{FO} = v_F - v_R$	4410	6900	No
$v_R$	1270	2100	No
$v_3$ or $v_{av34}$	1930 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, $v_{12A} = 3750$		(Equation 13-15, 13-16, 13-18, or 13-19)	

#### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
$v_{12}$	3750	4400	No

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

Density,	$D = 4.252 + 0.0086 v_R - 0.009 L_D$	$= 27.5 \text{ pc/mi/ln}$
Level of service for ramp-freeway junction areas of influence C		

#### Speed Estimation

Intermediate speed variable,	$D_S = 0.477$	
Space mean speed in ramp influence area,	$S_R = 51.4$	mph
Space mean speed in outer lanes,	$S_0 = 62.2$	mph
Space mean speed for all vehicles,	$S = 54.6$	mph