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### Diverge Analysis

Analyst: JP  
Agency/Co.: Florence & Hutcheson  
Date performed: 1/24/2012  
Analysis time period: AM  
Freeway/Dir of Travel: I-85 NB C-D  
Junction: I-85NB C-D to I-385NB  
Jurisdiction: Greenville, SC  
Analysis Year: 2015  
Description: I-85/I-385 Alternate 4A

### Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	55.0	mph
Volume on freeway	1122	vph

### Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	733	vph
Length of first accel/decel lane	0	ft
Length of second accel/decel lane		ft

### Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	535	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	700	ft

### Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1122	733	535	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	312	204	149	v
Trucks and buses	18	15	15	%
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	0.930	0.930	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	1359	876	639	pcph

#### Estimation of V12 Diverge Areas

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

EQ

P = 1.000 Using Equation 0

FD

$v_{12} = v_R + (v_F - v_R) P_{FD} = 1359 \text{ pc/h}$

#### Capacity Checks

	Actual	Maximum	LOS F?
$v_F = v_{Fi}$	1359	4500	No
$v_F = v_F - v_R$	483	4500	No
$v_R$	876	2100	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, $v_{12A} = 1359$		(Equation 13-15, 13-16, 13-18, or 13-19)	

#### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
$v_{12}$	1359	4400	No

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

Density,	$D = 4.252 + 0.0086 v_R - 0.009 L_D$	$= 15.9 \text{ pc/mi/ln}$
Level of service for ramp-freeway junction areas of influence B		

#### Speed Estimation

Intermediate speed variable,	$D_S = 0.377$	
Space mean speed in ramp influence area,	$S_R = 50.1$	mph
Space mean speed in outer lanes,	$S_0 = \text{N/A}$	mph
Space mean speed for all vehicles,	$S = 50.1$	mph