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### Diverge Analysis

Analyst: JP  
Agency/Co.: Florence & Hutcheson  
Date performed: 1/31/2012  
Analysis time period: PM  
Freeway/Dir of Travel: I-85 SB C-D  
Junction: I-385NB & Woodruff  
Jurisdiction: Greenville, SC  
Analysis Year: 2035  
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	2727	vph

### Off Ramp Data

Side of freeway	Left	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	416	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?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

### Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2727	416		vph
Peak-hour factor, PHF	0.90	0.90		
Peak 15-min volume, v15	758	116		v
Trucks and buses	18	18		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.917	0.917	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3303	504	pcph

# Estimation of V12 Diverge Areas

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

EQ

P = 1.000 Using Equation 0

FD

$v_{12} = v_R + (v_F - v_R) P_{FD} = 3303 \text{ pc/h}$

# Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3303	4500	No
$v_{FO} = v_F - v_R$	2799	4500	No
$v_R$	504	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, $v_{12A} = 3303$		(Equation 13-15, 13-16, 13-18, or 13-19)	

# Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
$v_{12}$	3303	4400	No

# Level of Service Determination (if not F)

Density,  $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 32.7 \text{ pc/mi/ln}$

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

# Speed Estimation

Intermediate speed variable,	$D_S = 0.343$	
Space mean speed in ramp influence area,	$S_R = 50.5$	mph
Space mean speed in outer lanes,	$S_0 = \text{N/A}$	mph
Space mean speed for all vehicles,	$S = 50.5$	mph