

Florence & Hutcheson  
501 Huger Street  
Columbia, SC 29201

Phone: (803)254-5800  
E-mail:

Fax: (803)929-0334

### Diverge Analysis

Analyst: JP  
Agency/Co.: Florence & Hutcheson  
Date performed: 8/25/2011  
Analysis time period: PM  
Freeway/Dir of Travel: I-385 NB  
Junction: Roper Mtn Rd  
Jurisdiction: Greenville, SC  
Analysis Year: 2035  
Description: I-85/I-385 Alternate 4A

### Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	5	
Free-flow speed on freeway	55.0	mph
Volume on freeway	8318	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	1444	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	1329	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)	8318	1444	1329	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	2311	401	369	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	10074	1749	1610	pcph

#### Estimation of V12 Diverge Areas

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

$$EQ$$

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

$$FD$$

$$v_{12} = v_R + (v_F - v_R) P = 3390 \quad \text{pc/h}$$

#### Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	8060	9000	No
$v_{FO} = v_F - v_R$	6311	9000	No
$v_R$	1749	4400	No
$v_3$ or $v_{av34}$	2335 pc/h	(Equation 13-14 or 13-17)	
Is $v_3$ or $v_{av34} > 2700$ pc/h?		No	
Is $v_3$ or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 3390$		(Equation 13-15, 13-16, 13-18, or 13-19)	

#### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
$v_{12}$	3390	4400	No

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

$$\text{Density, } D = 4.252 + 0.0086 v_R - 0.009 L_D = -7.1 \quad \text{pc/mi/ln}$$

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

#### Speed Estimation

Intermediate speed variable,	$D = 0.325$	
Space mean speed in ramp influence area,	$S_R = 50.8$	mph
Space mean speed in outer lanes,	$S_0 = 55.1$	mph
Space mean speed for all vehicles,	$S = 53.2$	mph