

Florence & Hutcheson
501 Huger Street
Columbia, SC 29201

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

Fax: (803)929-0334

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 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	4229	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	966	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	1083	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1100	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4229	966	1083	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	1175	268	301	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	5122	1170	1312	pcph

Estimation of V12 Diverge Areas

$$L = 13134.97 \text{ Equation 13-12 or 13-13}$$

$$EQ$$

$$P = 1.000 \text{ Using Equation 6}$$

$$FD$$

$$v_{12} = v_R + (v_F - v_R) P = 5122 \text{ pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	5122	6900	No
$v_{FO} = v_F - v_R$	3952	6900	No
v_R	1170	2100	No
$v_3 \text{ or } v_{av34}$	0 pc/h	(Equation 13-14 or 13-17)	
Is $v_3 \text{ or } v_{av34} > 2700 \text{ pc/h?}$		No	
Is $v_3 \text{ or } v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 5122$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	5122	4400	Yes

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_R - 0.009 \frac{L}{D} = 39.3 \text{ pc/mi/ln}$$

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

Speed Estimation

Intermediate speed variable,	$D = 0.468$	
Space mean speed in ramp influence area,	$S_R = 51.6$	mph
Space mean speed in outer lanes,	$S_0 = 65.8$	mph
Space mean speed for all vehicles,	$S = 51.6$	mph