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-----Diverge Analysis-----

Analyst: NJ
Agency/Co.: Florence & Hutcheson
Date performed: 3/29/2011
Analysis time period: AM
Freeway/Dir of Travel: I-385 SB
Junction: Woodruff Rd on-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	3184	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	1187	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	465	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	910	ft

-----Conversion to pc/h Under Base Conditions-----

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	3184		1187		465	vph
Peak-hour factor, PHF	0.90		0.90		0.90	
Peak 15-min volume, v15	884		330		129	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	3856	1438	563	pcph

Estimation of V12 Diverge Areas

$$L = 11170.63 \text{ Equation 13-12 or 13-13}$$

$$EQ$$

$$P = 0.940 \text{ Using Equation 6}$$

$$FD$$

$$v_{12} = v_R + (v_F - v_R) P = 3712 \text{ pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3856	6900	No
$v_{FO} = v_F - v_R$	2418	6900	No
v_R	1438	2100	No
v_3 or v_{av34}	144 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, $v_{12A} = 3712$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	3712	4400	No

Level of Service Determination (if not F)

$$\text{Density, } D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 27.2 \text{ pc/mi/ln}$$

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

Speed Estimation

Intermediate speed variable,	$D_S = 0.427$	
Space mean speed in ramp influence area,	$S_R = 52.3$	mph
Space mean speed in outer lanes,	$S_0 = 65.8$	mph
Space mean speed for all vehicles,	$S = 52.7$	mph