

Phone: Fax:
E-mail:

_____Merge Analysis_____

Analyst:
Agency/Co.: Stantec
Date performed: 11/10/2016
Analysis time period: 2:00PM:3:00PM
Freeway/Dir of Travel: I-85 Northbound
Junction: Shelby Hwy On Ramp to I-85 NB
Jurisdiction: SCDOT
Analysis Year: 2040 No Build Conditions
Description:

_____Freeway Data_____

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	69.5	mph
Volume on freeway	3361	vph

_____On Ramp Data_____

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	330	vph
Length of first accel/decel lane	560	ft
Length of second accel/decel lane		ft

_____Adjacent Ramp Data (if one exists)_____

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	217	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1675	ft

_____Conversion to pc/h Under Base Conditions_____

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3361	330	217	vph
Peak-hour factor, PHF	0.94	0.94	0.94	
Peak 15-min volume, v15	894	88	58	v
Trucks and buses	30	0	0	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	2.5	1.5	1.5	
Recreational vehicle PCE, ER	2.0	1.2	1.2	

Heavy vehicle adjustment, fHV	0.690	1.000	1.000	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	5185	351	231	pcph

Estimation of V12 Merge Areas

L

=

(Equation 13-6 or 13-7)

EQ

P

=

1.000

Using Equation

0

FM

v

=

v

(P

)

=

5185

pc/h

12

F

FM

Capacity Checks

		Actual	Maximum	LOS F?
v		5536	4790	Yes
FO				
v	or v	0	pc/h	(Equation 13-14 or 13-17)
3	av34			
Is	v	or v	> 2700 pc/h?	No
3	av34			
Is	v	or v	> 1.5 v	No
3	av34	12	/2	
If yes, v	= 5185		(Equation 13-15, 13-16, 13-18, or 13-19)	
12A				

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v	5536	4600	Yes
R12			

Level of Service Determination (if not F)

Density, D = 5.475 + 0.00734 v

+ 0.0078 v

- 0.00627 L

=

45.0

pc/mi/ln

R

R

12

A

Level of service for ramp-freeway junction areas of influence

F

Speed Estimation

Intermediate speed variable,	M	=	1.271	
	S			
Space mean speed in ramp influence area,	S	=	34.5	mph
	R			
Space mean speed in outer lanes,	S	=	N/A	mph
	0			
Space mean speed for all vehicles,	S	=	34.5	mph