

Phone: Fax:
E-mail:

Merge Analysis

Analyst:
Agency/Co.: Stantec
Date performed: 11/9/2016
Analysis time period: 8:00AM-9:00AM
Freeway/Dir of Travel: I-85 Southbound
Junction: US 29 Off Ramp to I-85 SB
Jurisdiction: SCDOT
Analysis Year: 2040 Build Conditions
Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.3	mph
Volume on freeway	1699	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	159	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	72	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2738	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1699	159	72	vph
Peak-hour factor, PHF	0.94	0.94	0.94	
Peak 15-min volume, v15	452	42	19	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	2621	169	77	pcph

Estimation of V12 Merge Areas

$$L = 691.26 \quad (\text{Equation 13-6 or 13-7})$$

$$EQ$$

$$P = 0.619 \quad \text{Using Equation 1}$$

$$FM$$

$$v_{12} = v_F (P_{FM}) = 1624 \quad \text{pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2790	7200	No
v_3 or v_{av34}	997 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700$ pc/h?		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		Yes	
If yes, $v_{12A} = 1624$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	1793	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 10.0 - \text{pc/mi/ln}$$

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

Speed Estimation

Intermediate speed variable,	$M_S = 0.239$	
Space mean speed in ramp influence area,	$S_R = 63.5$	mph
Space mean speed in outer lanes,	$S_0 = 68.5$	mph
Space mean speed for all vehicles,	$S = 65.2$	mph

Phone: _____ Fax: _____
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_____ Merge Analysis _____

Analyst: _____
 Agency/Co.: Stantec
 Date performed: 11/9/2016
 Analysis time period: 8:00AM-9:00AM
 Freeway/Dir of Travel: I-85 Southbound
 Junction: Tribal Rd On Ramp to I-85 SB
 Jurisdiction: SCDOT
 Analysis Year: 2040 Build Conditions
 Description: _____

_____ Freeway Data _____

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	69.0	mph
Volume on freeway	1470	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	254	vph
Length of first accel/decel lane	1280	ft
Length of second accel/decel lane		ft

_____ Adjacent Ramp Data (if one exists) _____

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	388	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1615	ft

_____ Conversion to pc/h Under Base Conditions _____

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1470	254	388	vph
Peak-hour factor, PHF	0.94	0.94	0.94	
Peak 15-min volume, v15	391	68	103	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	2268	270	413	pcph

Estimation of V12 Merge Areas				
L	=	539.65	(Equation 13-6 or 13-7)	
EQ				
P	=	0.613	Using Equation 1	
FM				
v ₁₂	= v _F (P _{FM})	=	1391	pc/h

Capacity Checks				
v _{FO}		Actual	Maximum	LOS F?
		2538	7170	No
v ₃ or v _{av34}		877 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		Yes	
If yes, v _{12A}	= 1391	(Equation 13-15, 13-16, 13-18, or 13-19)		

Flow Entering Merge Influence Area			
v _{12A}	Actual	Max Desirable	Violation?
	1661	4600	No

Level of Service Determination (if not F)				
Density, D _R	=	5.475 + 0.00734 v _R + 0.0078 v ₁₂ - 0.00627 L _A	=	10.3 pc/mi/ln
Level of service for ramp-freeway junction areas of influence B				

Speed Estimation			
Intermediate speed variable,	M _S	=	0.252
Space mean speed in ramp influence area,	S _R	=	62.2 mph
Space mean speed in outer lanes,	S ₀	=	67.6 mph
Space mean speed for all vehicles,	S	=	64.0 mph

Phone: Fax:
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Merge Analysis

Analyst:
Agency/Co.: Stantec
Date performed: 11/9/2016
Analysis time period: 8:00AM-9:00AM
Freeway/Dir of Travel: I-85 Southbound
Junction: Tribal Rd On Ramp to I-85 SB
Jurisdiction: SCDOT
Analysis Year: 2040 Build Conditions
Description:

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	69.0	mph
Volume on freeway	1470	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	254	vph
Length of first accel/decel lane	1280	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	99	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	3467	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1470	254	99	vph
Peak-hour factor, PHF	0.94	0.94	0.94	
Peak 15-min volume, v15	391	68	26	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	2268	270	105	pcph

Estimation of V12 Merge Areas

$$L = 425.86 \quad (\text{Equation 13-6 or 13-7})$$

$$EQ$$

$$P = 0.613 \quad \text{Using Equation 1}$$

$$FM$$

$$v_{12} = v_F (P_{FM}) = 1391 \quad \text{pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
v _{FO}	2538	7170	No
v ₃ or v _{av34}	877 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		Yes	
If yes, v _{12A} = 1391		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v _{12A}	1661	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 10.3 \quad \text{pc/mi/ln}$$

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

Speed Estimation

Intermediate speed variable,	M _S = 0.252	
Space mean speed in ramp influence area,	S _R = 62.2	mph
Space mean speed in outer lanes,	S ₀ = 67.6	mph
Space mean speed for all vehicles,	S = 64.0	mph

Phone: Fax:
E-mail:

_____Merge Analysis_____

Analyst:
Agency/Co.: Stantec
Date performed: 11/9/2016
Analysis time period: 8:00AM-9:00AM
Freeway/Dir of Travel: I-85 Southbound
Junction: Welcome Cntr On Ramp to I-85 S
Jurisdiction: SCCDOT
Analysis Year: 2040 Build Conditions
Description:

_____Freeway Data_____

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	69.4	mph
Volume on freeway	1625	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	99	vph
Length of first accel/decel lane	875	ft
Length of second accel/decel lane		ft

_____Adjacent Ramp Data (if one exists)_____

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	99	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2352	ft

_____Conversion to pc/h Under Base Conditions_____

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1625	99	99	vph
Peak-hour factor, PHF	0.94	0.94	0.94	
Peak 15-min volume, v15	432	26	26	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	2507	105	105	pcph

Estimation of V12 Merge Areas

$$L = 375.67 \quad (\text{Equation 13-6 or 13-7})$$

$$EQ$$

$$P = 0.602 \quad \text{Using Equation 1}$$

$$FM$$

$$v_{12} = v_F (P_{FM}) = 1509 \quad \text{pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2612	7182	No
v_3 or v_{av34}	998 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700$ pc/h?		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		Yes	
If yes, $v_{12A} = 1509$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	1614	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 12.5 \quad \text{pc/mi/ln}$$

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

Speed Estimation

Intermediate speed variable,	$M_S = 0.279$	
Space mean speed in ramp influence area,	$S_R = 61.7$	mph
Space mean speed in outer lanes,	$S_0 = 67.6$	mph
Space mean speed for all vehicles,	$S = 63.9$	mph

Phone: _____ Fax: _____
 E-mail: _____

_____ Merge Analysis _____

Analyst: _____
 Agency/Co.: Stantec
 Date performed: 11/9/2016
 Analysis time period: 8:00AM-9:00AM
 Freeway/Dir of Travel: I-85 Southbound
 Junction: Welcome Cntr On Ramp to I-85 S
 Jurisdiction: SCCDOT
 Analysis Year: 2040 Build Conditions
 Description: _____

_____ Freeway Data _____

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	69.4	mph
Volume on freeway	1625	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	99	vph
Length of first accel/decel lane	875	ft
Length of second accel/decel lane		ft

_____ Adjacent Ramp Data (if one exists) _____

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	96	vph
Position of adjacent Ramp	Downstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2216	ft

_____ Conversion to pc/h Under Base Conditions _____

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1625	99	96	vph
Peak-hour factor, PHF	0.94	0.94	0.94	
Peak 15-min volume, v15	432	26	26	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	2507	105	102	pcph

Estimation of V12 Merge Areas

$$L = 501.91 \quad (\text{Equation 13-6 or 13-7})$$

$$EQ$$

$$P = 0.602 \quad \text{Using Equation 1}$$

$$FM$$

$$v_{12} = v_F (P_{FM}) = 1509 \quad \text{pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
v _{FO}	2612	7182	No
v ₃ or v _{av34}	998 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		Yes	
If yes, v _{12A} = 1509		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v _{12A}	1614	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 12.5 \quad \text{pc/mi/ln}$$

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

Speed Estimation

Intermediate speed variable,	M _S = 0.279	
Space mean speed in ramp influence area,	S _R = 61.7	mph
Space mean speed in outer lanes,	S ₀ = 67.6	mph
Space mean speed for all vehicles,	S = 63.9	mph

Phone: Fax:
E-mail:

-----Merge Analysis-----

Analyst:
Agency/Co.: Stantec
Date performed: 11/9/2016
Analysis time period: 8:00AM-9:00AM
Freeway/Dir of Travel: I-85 Southbound
Junction: SC 5 On Ramp to I-85 SB
Jurisdiction: SCDOT
Analysis Year: 2040 Build Conditions
Description:

-----Freeway Data-----

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	69.4	mph
Volume on freeway	1628	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	574	vph
Length of first accel/decel lane	675	ft
Length of second accel/decel lane		ft

-----Adjacent Ramp Data (if one exists)-----

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	96	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2290	ft

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

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1628	574	96	vph
Peak-hour factor, PHF	0.94	0.94	0.94	
Peak 15-min volume, v15	433	153	26	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	2511	611	102	pcph

Estimation of V12 Merge Areas

$$L = 396.01 \quad (\text{Equation 13-6 or 13-7})$$

EQ

$$P = 0.596 \quad \text{Using Equation 1}$$

FM

$$v_{12} = v_F(P_{FM}) = 1498 \quad \text{pc/h}$$

12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v _{FO}	3122	7182	No
v ₃ or v _{av34}	1013 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		Yes	
If yes, v _{12A} = 1498		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v _{12A}	2109	4600	No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 17.4 \quad \text{pc/mi/ln}$
 Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M _S = 0.306	
Space mean speed in ramp influence area,	S _R = 61.0	mph
Space mean speed in outer lanes,	S ₀ = 67.6	mph
Space mean speed for all vehicles,	S = 63.0	mph

Phone: Fax:
E-mail:

_____ Merge Analysis _____

Analyst:
Agency/Co.: Stantec
Date performed: 11/16/2016
Analysis time period: 8:00AM-9:00AM
Freeway/Dir of Travel: I-85 Southbound
Junction: Blacksburg On Ramp to I-85 SB
Jurisdiction: SCDOT
Analysis Year: 2040 Build Conditions
Description:

_____ Freeway Data _____

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	69.8	mph
Volume on freeway	2079	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	254	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

_____ Adjacent Ramp Data (if one exists) _____

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	123	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	2560	ft

_____ Conversion to pc/h Under Base Conditions _____

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2079	254	123	vph
Peak-hour factor, PHF	0.94	0.94	0.94	
Peak 15-min volume, v15	553	68	33	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	3207	270	131	pcph

Estimation of V12 Merge Areas

$$L = 394.28 \quad (\text{Equation 13-6 or 13-7})$$

$$EQ$$

$$P = 0.591 \quad \text{Using Equation 1}$$

$$FM$$

$$v_{12} = v_F (P_{FM}) = 1897 \quad \text{pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3477	7194	No
v_3 or v_{av34}	1310 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700$ pc/h?		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		Yes	
If yes, $v_{12A} = 1897$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2167	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 19.1 \quad \text{pc/mi/ln}$$

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

Speed Estimation

Intermediate speed variable,	$M_S = 0.320$	
Space mean speed in ramp influence area,	$S_R = 60.9$	mph
Space mean speed in outer lanes,	$S_0 = 66.9$	mph
Space mean speed for all vehicles,	$S = 63.0$	mph

Phone: Fax:
E-mail:

-----Merge Analysis-----

Analyst:
Agency/Co.: Stantec
Date performed: 11/9/2016
Analysis time period: 8:00AM-9:00AM
Freeway/Dir of Travel: I-85 Southbound
Junction: Shelby Hwy On Ramp to I-85 SB
Jurisdiction: SCDOT
Analysis Year: 2040 Build Conditions
Description:

-----Freeway Data-----

Type of analysis	Merge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.7	mph
Volume on freeway	2264	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	426	vph
Length of first accel/decel lane	365	ft
Length of second accel/decel lane		ft

-----Adjacent Ramp Data (if one exists)-----

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	69	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1322	ft

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

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2264	426	69	vph
Peak-hour factor, PHF	0.94	0.94	0.94	
Peak 15-min volume, v15	602	113	18	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	3492	453	73	pcph

Estimation of V12 Merge Areas

$$L = 434.49 \quad (\text{Equation 13-6 or 13-7})$$

$$EQ$$

$$P = 0.588 \quad \text{Using Equation 1}$$

$$FM$$

$$v_{12} = v_F(P_{FM}) = 2052 \quad \text{pc/h}$$

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3945	7200	No
v_3 or v_{av34}	1440 pc/h	(Equation 13-14 or 13-17)	
Is v_3 or $v_{av34} > 2700$ pc/h?		No	
Is v_3 or $v_{av34} > 1.5 v_{12} / 2$		Yes	
If yes, $v_{12A} = 2052$		(Equation 13-15, 13-16, 13-18, or 13-19)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{12A}	2505	4600	No

Level of Service Determination (if not F)

$$\text{Density, } D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 22.5 \quad \text{pc/mi/ln}$$

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

Speed Estimation

Intermediate speed variable,	$M_S = 0.343$	
Space mean speed in ramp influence area,	$S_R = 60.9$	mph
Space mean speed in outer lanes,	$S_0 = 67.3$	mph
Space mean speed for all vehicles,	$S = 63.1$	mph