

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_  
 E-mail: \_\_\_\_\_

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

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

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

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	69.5	mph
Volume on freeway	2126	vph

-----Off Ramp Data-----

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	235	vph
Length of first accel/decel lane	696	ft
Length of second accel/decel lane		ft

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

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	197	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1675	ft

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

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2126	235	197	vph
Peak-hour factor, PHF	0.94	0.94	0.94	
Peak 15-min volume, v15	565	63	52	v
Trucks and buses	30	0	0	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 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	3279	250	210	pcph

#### Estimation of V12 Diverge Areas

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

EQ

$$P = 0.667 \quad \text{Using Equation 5}$$

FD

$$v_{12} = v_R + (v_F - v_R) P_{FD} = 2269 \quad \text{pc/h}$$

#### Capacity Checks

	Actual	Maximum	LOS F?
$v_F = v_{Fi}$	3279	7185	No
$v_F = v_F - v_R$	3029	7185	No
$v_R$	250	2000	No
$v_3$ or $v_{av34}$	1010 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, $v_{12A} = 2269$		(Equation 13-15, 13-16, 13-18, or 13-19)	

#### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
$v_{12}$	2269	4400	No

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

Density,	$D = 4.252 + 0.0086 v_R - 0.009 L_D$	$= 17.5$	pc/mi/ln
Level of service for ramp-freeway junction areas of influence B			

#### Speed Estimation

Intermediate speed variable,	$D_S = 0.451$	
Space mean speed in ramp influence area,	$S_R = 57.1$	mph
Space mean speed in outer lanes,	$S_0 = 76.2$	mph
Space mean speed for all vehicles,	$S = 61.9$	mph

Phone: Fax:  
E-mail:

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

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

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

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.3	mph
Volume on freeway	2331	vph

-----Off Ramp Data-----

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	2	vph
Length of first accel/decel lane	453	ft
Length of second accel/decel lane		ft

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

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	10	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	4730	ft

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

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2331	2	10	vph
Peak-hour factor, PHF	0.94	0.94	0.94	
Peak 15-min volume, v15	620	1	3	v
Trucks and buses	30	0	0	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 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	3596	2	11	pcph

#### Estimation of V12 Diverge Areas

$$L = 71.64 \quad (\text{Equation 13-12 or 13-13})$$

EQ

$$P = 0.670 \quad \text{Using Equation 5}$$

FD

$$v_{12} = v_R + (v_F - v_R) P_{FD} = 2410 \quad \text{pc/h}$$

#### Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3596	7200	No
$v_{FO} = v_F - v_R$	3594	7200	No
$v_R$	2	2000	No
$v_3$ or $v_{av34}$	1186 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, $v_{12A} = 2410$		(Equation 13-15, 13-16, 13-18, or 13-19)	

#### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
$v_{12}$	2410	4400	No

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

Density,	$D = 4.252 + 0.0086 v_R - 0.009 L_D$	$= 20.9$	pc/mi/ln
Level of service for ramp-freeway junction areas of influence C			

#### Speed Estimation

Intermediate speed variable,	$D_S = 0.428$	
Space mean speed in ramp influence area,	$S_R = 58.2$	mph
Space mean speed in outer lanes,	$S_0 = 76.4$	mph
Space mean speed for all vehicles,	$S = 63.1$	mph

Phone: Fax:  
E-mail:

### Diverge Analysis

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

### Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.3	mph
Volume on freeway	2331	vph

### Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	2	vph
Length of first accel/decel lane	435	ft
Length of second accel/decel lane		ft

### Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	399	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	6362	ft

### Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2331	2	399	vph
Peak-hour factor, PHF	0.94	0.94	0.94	
Peak 15-min volume, v15	620	1	106	v
Trucks and buses	30	0	0	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 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	3596	2	424	pcph

#### Estimation of V12 Diverge Areas

$$L = 410.14 \quad (\text{Equation 13-12 or 13-13})$$

EQ

$$P = 0.670 \quad \text{Using Equation 5}$$

FD

$$v_{12} = v_R + (v_F - v_R) P_{FD} = 2410 \quad \text{pc/h}$$

#### Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3596	7200	No
$v_{FO} = v_F - v_R$	3594	7200	No
$v_R$	2	2000	No
$v_3$ or $v_{av34}$	1186 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, $v_{12A} = 2410$		(Equation 13-15, 13-16, 13-18, or 13-19)	

#### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
$v_{12}$	2410	4400	No

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

Density,	$D = 4.252 + 0.0086 v_R - 0.009 L_D$	$= 21.1$	pc/mi/ln
Level of service for ramp-freeway junction areas of influence C			

#### Speed Estimation

Intermediate speed variable,	$D_S = 0.428$	
Space mean speed in ramp influence area,	$S_R = 58.2$	mph
Space mean speed in outer lanes,	$S_0 = 76.4$	mph
Space mean speed for all vehicles,	$S = 63.1$	mph

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_  
 E-mail: \_\_\_\_\_

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

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

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

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	69.8	mph
Volume on freeway	1932	vph

-----Off Ramp Data-----

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	399	vph
Length of first accel/decel lane	385	ft
Length of second accel/decel lane		ft

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

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	2	vph
Position of adjacent ramp	Upstream	
Type of adjacent ramp	Off	
Distance to adjacent ramp	6362	ft

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

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1932	399	2	vph
Peak-hour factor, PHF	0.94	0.94	0.94	
Peak 15-min volume, v15	514	106	1	v
Trucks and buses	30	0	0	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 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	2980	424	2	pcph

#### Estimation of V12 Diverge Areas

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

EQ

$$P = 0.666 \quad \text{Using Equation 5}$$

FD

$$v_{12} = v_R + (v_F - v_R) P_{FD} = 2126 \quad \text{pc/h}$$

#### Capacity Checks

	Actual	Maximum	LOS F?
$v_F = v_{Fi}$	2980	7194	No
$v_F = v_F - v_R$	2556	7194	No
$v_R$	424	2000	No
$v_3$ or $v_{av34}$	854 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, $v_{12A} = 2126$		(Equation 13-15, 13-16, 13-18, or 13-19)	

#### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
$v_{12}$	2126	4400	No

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

Density,	$D = 4.252 + 0.0086 v_R - 0.009 L_D$	$= 19.1$	pc/mi/ln
Level of service for ramp-freeway junction areas of influence B			

#### Speed Estimation

Intermediate speed variable,	$D_S = 0.466$	
Space mean speed in ramp influence area,	$S_R = 56.8$	mph
Space mean speed in outer lanes,	$S_0 = 76.6$	mph
Space mean speed for all vehicles,	$S = 61.4$	mph

Phone: Fax:  
E-mail:

### Diverge Analysis

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

### Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	69.8	mph
Volume on freeway	1932	vph

### Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	399	vph
Length of first accel/decel lane	385	ft
Length of second accel/decel lane		ft

### Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	102	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1440	ft

### Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1932	399	102	vph
Peak-hour factor, PHF	0.94	0.94	0.94	
Peak 15-min volume, v15	514	106	27	v
Trucks and buses	30	0	0	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 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	2980	424	109	pcph

#### Estimation of V12 Diverge Areas

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

EQ

$$P = 0.666 \quad \text{Using Equation 5}$$

FD

$$v_{12} = v_R + (v_F - v_R) P_{FD} = 2126 \quad \text{pc/h}$$

#### Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2980	7194	No
$v_{FO} = v_F - v_R$	2556	7194	No
$v_R$	424	2000	No
$v_3$ or $v_{av34}$	854 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, $v_{12A} = 2126$		(Equation 13-15, 13-16, 13-18, or 13-19)	

#### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
$v_{12}$	2126	4400	No

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

Density,	$D = 4.252 + 0.0086 v_R - 0.009 L_D$	$= 19.1$	pc/mi/ln
Level of service for ramp-freeway junction areas of influence B			

#### Speed Estimation

Intermediate speed variable,	$D_S = 0.466$	
Space mean speed in ramp influence area,	$S_R = 56.8$	mph
Space mean speed in outer lanes,	$S_0 = 76.6$	mph
Space mean speed for all vehicles,	$S = 61.4$	mph

Phone: Fax:  
E-mail:

### Diverge Analysis

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

### Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.7	mph
Volume on freeway	1691	vph

### Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	343	vph
Length of first accel/decel lane	250	ft
Length of second accel/decel lane		ft

### Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	186	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	3940	ft

### Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1691	343	186	vph
Peak-hour factor, PHF	0.94	0.94	0.94	
Peak 15-min volume, v15	450	91	49	v
Trucks and buses	30	0	0	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 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	2608	365	198	pcph

#### Estimation of V12 Diverge Areas

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

EQ

$$P = 0.678 \quad \text{Using Equation 5}$$

FD

$$v_{12} = v_R + (v_F - v_R) P_{FD} = 1886 \quad \text{pc/h}$$

#### Capacity Checks

	Actual	Maximum	LOS F?
$v_F = v_{Fi}$	2608	7200	No
$v_F = v_F - v_R$	2243	7200	No
$v_R$	365	2000	No
$v_3$ or $v_{av34}$	722 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, $v_{12A} = 1886$		(Equation 13-15, 13-16, 13-18, or 13-19)	

#### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
$v_{12}$	1886	4400	No

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

Density,	$D = 4.252 + 0.0086 v_R - 0.009 L_D$	$= 18.2$	pc/mi/ln
Level of service for ramp-freeway junction areas of influence B			

#### Speed Estimation

Intermediate speed variable,	$D_S = 0.461$	
Space mean speed in ramp influence area,	$S_R = 57.5$	mph
Space mean speed in outer lanes,	$S_0 = 77.6$	mph
Space mean speed for all vehicles,	$S = 61.9$	mph

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_  
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-----Diverge Analysis-----

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

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

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.3	mph
Volume on freeway	1678	vph

-----Off Ramp Data-----

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	199	vph
Length of first accel/decel lane	1190	ft
Length of second accel/decel lane		ft

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

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	141	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1111	ft

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

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1678	199	141	vph
Peak-hour factor, PHF	0.94	0.94	0.94	
Peak 15-min volume, v15	446	53	38	v
Trucks and buses	30	0	0	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 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	2588	212	150	pcph

#### Estimation of V12 Diverge Areas

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

EQ

$$P = 0.686 \quad \text{Using Equation 5}$$

FD

$$v_{12} = v_R + (v_F - v_R) P_{FD} = 1841 \quad \text{pc/h}$$

#### Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2588	7200	No
$v_{FO} = v_F - v_R$	2376	7200	No
$v_R$	212	2000	No
$v_3$ or $v_{av34}$	747 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, $v_{12A} = 1841$		(Equation 13-15, 13-16, 13-18, or 13-19)	

#### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
$v_{12}$	1841	4400	No

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

Density,	$D = 4.252 + 0.0086 v_R - 0.009 \frac{L}{D}$	$= 9.4$	pc/mi/ln
Level of service for ramp-freeway junction areas of influence A			

#### Speed Estimation

Intermediate speed variable,	$D_S = 0.447$	
Space mean speed in ramp influence area,	$S_R = 57.6$	mph
Space mean speed in outer lanes,	$S_0 = 77.1$	mph
Space mean speed for all vehicles,	$S = 62.2$	mph

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_  
 E-mail: \_\_\_\_\_

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

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

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

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.7	mph
Volume on freeway	1758	vph

----- Off Ramp Data -----

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	61	vph
Length of first accel/decel lane	260	ft
Length of second accel/decel lane		ft

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

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	113	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	745	ft

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

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1758	61	113	vph
Peak-hour factor, PHF	0.94	0.94	0.94	
Peak 15-min volume, v15	468	16	30	v
Trucks and buses	30	0	0	%
Recreational vehicles	0	0	0	%
Terrain type:	Rolling	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 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	2712	65	120	pcph

#### Estimation of V12 Diverge Areas

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

EQ

$$P = 0.689 \quad \text{Using Equation 5}$$

FD

$$v_{12} = v_R + (v_F - v_R) P_{FD} = 1889 \quad \text{pc/h}$$

#### Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2712	7200	No
$v_{FO} = v_F - v_R$	2647	7200	No
$v_R$	65	2000	No
$v_3$ or $v_{av34}$	823 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, $v_{12A} = 1889$		(Equation 13-15, 13-16, 13-18, or 13-19)	

#### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
$v_{12}$	1889	4400	No

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

Density,	$D = 4.252 + 0.0086 v_R - 0.009 \frac{L}{D}$	$= 18.2$	pc/mi/ln
Level of service for ramp-freeway junction areas of influence B			

#### Speed Estimation

Intermediate speed variable,	$D_S = 0.434$	
Space mean speed in ramp influence area,	$S_R = 58.2$	mph
Space mean speed in outer lanes,	$S_0 = 77.6$	mph
Space mean speed for all vehicles,	$S = 63.0$	mph