

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

-----Diverge 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: I-85 NB Off Ramp to Shelby Hwy  
 Jurisdiction: SCDOT  
 Analysis Year: 2015 Existing Conditions  
 Description: \_\_\_\_\_

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

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	69.5	mph
Volume on freeway	2297	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	258	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	169	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)	2297	258	169	vph
Peak-hour factor, PHF	0.94	0.94	0.94	
Peak 15-min volume, v15	611	69	45	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	3543	274	180	pcph

#### Estimation of V12 Diverge Areas

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

$$EQ$$

$$P = 1.000 \quad \text{Using Equation } 0$$

$$FD$$

$$v_{12} = v_R + (v_F - v_R) P = 3543 \quad \text{pc/h}$$

#### Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3543	4790	No
$v_{FO} = v_F - v_R$	3269	4790	No
$v_R$	274	2000	No
$v_3$ or $v_{av34}$	0 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, $v_{12A} = 3543$		(Equation 13-15, 13-16, 13-18, or 13-19)	

#### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
$v_{12}$	3543	4400	No

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

$$\text{Density, } D = 4.252 + 0.0086 v_R - 0.009 L_D = 28.5 \quad \text{pc/mi/ln}$$

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

#### Speed Estimation

Intermediate speed variable,	$D_S = 0.453$	
Space mean speed in ramp influence area,	$S_R = 57.1$	mph
Space mean speed in outer lanes,	$S_0 = \text{N/A}$	mph
Space mean speed for all vehicles,	$S = 57.1$	mph

Phone: Fax:  
E-mail:

-----Diverge 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: I-85 NB Off Ramp to Frontage  
Jurisdiction: SCDOT  
Analysis Year: 2015 Existing Conditions  
Description:

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

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.3	mph
Volume on freeway	2472	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	8	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)	2472	2	8	vph
Peak-hour factor, PHF	0.94	0.94	0.94	
Peak 15-min volume, v15	657	1	2	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	3813	2	9	pcph

#### Estimation of V12 Diverge Areas

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

EQ

$$P = 1.000 \quad \text{Using Equation } 0$$

FD

$$v_{12} = v_R + (v_F - v_R) P_{FD} = 3813 \quad \text{pc/h}$$

#### Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3813	4800	No
$v_{FO} = v_F - v_R$	3811	4800	No
$v_R$	2	2000	No
$v_3$ or $v_{av34}$	0 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, $v_{12A} = 3813$		(Equation 13-15, 13-16, 13-18, or 13-19)	

#### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
$v_{12}$	3813	4400	No

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

Density,	$D = 4.252 + 0.0086 v_R - 0.009 L_D$	$= 33.0$	pc/mi/ln
Level of service for ramp-freeway junction areas of influence D			

#### 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,	$S_0 = \text{N/A}$	mph
Space mean speed for all vehicles,	$S = 58.2$	mph

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-----Diverge 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: I-85 NB Off Ramp to Frontage  
 Jurisdiction: SCDOT  
 Analysis Year: 2015 Existing Conditions  
 Description: \_\_\_\_\_

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

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.3	mph
Volume on freeway	2472	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	155	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)	2472	2	155	vph
Peak-hour factor, PHF	0.94	0.94	0.94	
Peak 15-min volume, v15	657	1	41	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	3813	2	165	pcph

#### Estimation of V12 Diverge Areas

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

$$EQ$$

$$P = 1.000 \quad \text{Using Equation } 0$$

$$FD$$

$$v_{12} = v_R + (v_F - v_R) P = 3813 \quad \text{pc/h}$$

#### Capacity Checks

	Actual	Maximum	LOS F?
$v_F = v_{Fi}$	3813	4800	No
$v_F = v_F - v_R$	3811	4800	No
$v_R$	2	2000	No
$v_3$ or $v_{av34}$	0 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, $v_{12A} = 3813$		(Equation 13-15, 13-16, 13-18, or 13-19)	

#### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
$v_{12}$	3813	4400	No

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

$$\text{Density, } D = 4.252 + 0.0086 v_R - 0.009 L_D = 33.1 \quad \text{pc/mi/ln}$$

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

#### 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,	$S_0 = \text{N/A}$	mph
Space mean speed for all vehicles,	$S = 58.2$	mph

Phone: Fax:  
E-mail:

### Diverge 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: I-85 NB Off Ramp to Blacksburg  
Jurisdiction: SCDOT  
Analysis Year: 2015 Existing Conditions  
Description:

### Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	69.8	mph
Volume on freeway	2317	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	155	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)	2317	155	2	vph
Peak-hour factor, PHF	0.94	0.94	0.94	
Peak 15-min volume, v15	616	41	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	3574	165	2	pcph

#### Estimation of V12 Diverge Areas

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

EQ

$$P = 1.000 \quad \text{Using Equation } 0$$

FD

$$v_{12} = v_R + (v_F - v_R) P_{FD} = 3574 \quad \text{pc/h}$$

#### Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3574	4796	No
$v_{FO} = v_F - v_R$	3409	4796	No
$v_R$	165	2000	No
$v_3$ or $v_{av34}$	0 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, $v_{12A} = 3574$		(Equation 13-15, 13-16, 13-18, or 13-19)	

#### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
$v_{12}$	3574	4400	No

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

Density,	$D = 4.252 + 0.0086 v_R - 0.009 L_D$	$= 31.5$	pc/mi/ln
Level of service for ramp-freeway junction areas of influence D			

#### Speed Estimation

Intermediate speed variable,	$D_S = 0.443$	
Space mean speed in ramp influence area,	$S_R = 57.5$	mph
Space mean speed in outer lanes,	$S_0 = \text{N/A}$	mph
Space mean speed for all vehicles,	$S = 57.5$	mph

Phone: Fax:  
E-mail:

### Diverge 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: I-85 NB Off Ramp to Blacksburg  
Jurisdiction: SCDOT  
Analysis Year: 2015 Existing Conditions  
Description:

### Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	69.8	mph
Volume on freeway	2317	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	155	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	52	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)	2317	155	52	vph
Peak-hour factor, PHF	0.94	0.94	0.94	
Peak 15-min volume, v15	616	41	14	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	3574	165	55	pcph

#### Estimation of V12 Diverge Areas

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

$$EQ$$

$$P = 1.000 \quad \text{Using Equation } 0$$

$$FD$$

$$v_{12} = v_R + (v_F - v_R) P = 3574 \quad \text{pc/h}$$

#### Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3574	4796	No
$v_{FO} = v_F - v_R$	3409	4796	No
$v_R$	165	2000	No
$v_3$ or $v_{av34}$	0 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, $v_{12A} = 3574$		(Equation 13-15, 13-16, 13-18, or 13-19)	

#### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
$v_{12}$	3574	4400	No

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

$$\text{Density, } D = 4.252 + 0.0086 v_R - 0.009 L_D = 31.5 \quad \text{pc/mi/ln}$$

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

#### Speed Estimation

Intermediate speed variable,	$D_S = 0.443$	
Space mean speed in ramp influence area,	$S_R = 57.5$	mph
Space mean speed in outer lanes,	$S_0 = \text{N/A}$	mph
Space mean speed for all vehicles,	$S = 57.5$	mph

Phone: Fax:  
E-mail:

### Diverge 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: I-85 NB Off Ramp to SC 5  
Jurisdiction: SCDOT  
Analysis Year: 2015 Existing Conditions  
Description:

### Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.7	mph
Volume on freeway	2014	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	355	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	105	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)	2014	355	105	vph
Peak-hour factor, PHF	0.94	0.94	0.94	
Peak 15-min volume, v15	536	94	28	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	3107	378	112	pcph

#### Estimation of V12 Diverge Areas

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

EQ

$$P = 1.000 \quad \text{Using Equation } 0$$

FD

$$v_{12} = v_R + (v_F - v_R) P_{FD} = 3107 \quad \text{pc/h}$$

#### Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3107	4800	No
$v_{FO} = v_F - v_R$	2729	4800	No
$v_R$	378	2000	No
$v_3$ or $v_{av34}$	0 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, $v_{12A} = 3107$		(Equation 13-15, 13-16, 13-18, or 13-19)	

#### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
$v_{12}$	3107	4400	No

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

Density,	$D = 4.252 + 0.0086 v_R - 0.009 L_D$	$= 28.7$	pc/mi/ln
Level of service for ramp-freeway junction areas of influence D			

#### Speed Estimation

Intermediate speed variable,	$D_S = 0.462$	
Space mean speed in ramp influence area,	$S_R = 57.4$	mph
Space mean speed in outer lanes,	$S_0 = \text{N/A}$	mph
Space mean speed for all vehicles,	$S = 57.4$	mph

Phone:  
E-mail:

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### Diverge 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: I-85 NB Off Ramp to Tribal Rd  
Jurisdiction: SCDOT  
Analysis Year: 2015 Existing Conditions  
Description:

### Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.3	mph
Volume on freeway	1988	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	131	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	113	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)	1988	131	113	vph
Peak-hour factor, PHF	0.94	0.94	0.94	
Peak 15-min volume, v15	529	35	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	3067	139	120	pcph

#### Estimation of V12 Diverge Areas

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

$$EQ$$

$$P = 1.000 \quad \text{Using Equation } 0$$

$$FD$$

$$v_{12} = v_R + (v_F - v_R) P_{FD} = 3067 \quad \text{pc/h}$$

#### Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3067	4800	No
$v_{FO} = v_F - v_R$	2928	4800	No
$v_R$	139	2000	No
$v_3$ or $v_{av34}$	0 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, $v_{12A} = 3067$		(Equation 13-15, 13-16, 13-18, or 13-19)	

#### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
$v_{12}$	3067	4400	No

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

Density,	$D = 4.252 + 0.0086 v_R - 0.009 L_D$	$= 19.9$	pc/mi/ln
Level of service for ramp-freeway junction areas of influence B			

#### Speed Estimation

Intermediate speed variable,	$D_S = 0.441$	
Space mean speed in ramp influence area,	$S_R = 57.8$	mph
Space mean speed in outer lanes,	$S_0 = \text{N/A}$	mph
Space mean speed for all vehicles,	$S = 57.8$	mph

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

-----Diverge 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: I-85 NB Off Loop to US 29  
 Jurisdiction: SCDOT  
 Analysis Year: 2015 Existing Conditions  
 Description: \_\_\_\_\_

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

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.7	mph
Volume on freeway	2015	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	86	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	88	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)	2015	86	88	vph
Peak-hour factor, PHF	0.94	0.94	0.94	
Peak 15-min volume, v15	536	23	23	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	3108	91	94	pcph

#### Estimation of V12 Diverge Areas

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

$$EQ$$

$$P = 1.000 \quad \text{Using Equation } 0$$

$$FD$$

$$v_{12} = v_R + (v_F - v_R) P_{FD} = 3108 \quad \text{pc/h}$$

#### Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3108	4800	No
$v_{FO} = v_F - v_R$	3017	4800	No
$v_R$	91	2000	No
$v_3$ or $v_{av34}$	0 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, $v_{12A} = 3108$		(Equation 13-15, 13-16, 13-18, or 13-19)	

#### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
$v_{12}$	3108	4400	No

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

$$\text{Density, } D = 4.252 + 0.0086 v_R - 0.009 \frac{L}{D} = 28.6 \quad \text{pc/mi/ln}$$

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

#### Speed Estimation

Intermediate speed variable,	$D_S = 0.436$	
Space mean speed in ramp influence area,	$S_R = 58.2$	mph
Space mean speed in outer lanes,	$S_0 = \text{N/A}$	mph
Space mean speed for all vehicles,	$S = 58.2$	mph