

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	AL				Freeway/Dir of Travel	I-75 WB			
Agency or Company	AIM ENGINEERING				Junction	SR 29 OFF RAMP			
Date Performed	3/8/2012				Jurisdiction				
Analysis Time Period	PM				Analysis Year	2019 EVERGLADES			
Project Description									
Inputs									
Upstream Adj Ramp		Number of Lanes, N			2 ✓			Downstream Adj Ramp	
<input type="checkbox"/> Yes <input type="checkbox"/> On		Acceleration Lane Length, L _A						<input type="checkbox"/> Yes <input type="checkbox"/> On	
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off		Deceleration Lane Length L _D			215			<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	
L _{up} = ft		Freeway Volume, V _F			1193 ✓			L _{down} = ft	
V _u = veh/h		Ramp Volume, V _R			157 ✓			V _D = veh/h	
		Freeway Free-Flow Speed, S _{FF}			70.0 ✓				
		Ramp Free-Flow Speed, S _{FR}			45.0 ✓				
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	1193	0.90 ✓	Level	6	0	0.971	0.90 ✓	1517	
Ramp	157	0.90 ✓	Level	22	0	0.901	0.90 ✓	215	
UpStream									
DownStream									
Merge Areas					Diverge Areas				
Estimation of v₁₂					Estimation of v₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = 1.000 using Equation (Exhibit 13-7) V ₁₂ = 1517 pc/h V ₃ or V _{av34} 0 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	1517	Exhibit 13-8	4800	No
					V _{FO} = V _F - V _R	1302	Exhibit 13-8	4800	No
					V _R	215	Exhibit 13-10	2100	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}		Exhibit 13-8			V ₁₂	1517	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = 15.4 (pc/mi/ln) LOS = B (Exhibit 13-2)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	AL				Freeway/Dir of Travel	I-75 WB			
Agency or Company	AIM ENGINEERING				Junction	SR 29 WB ON			
Date Performed	3/16/2012				Jurisdiction				
Analysis Time Period	PM				Analysis Year	2019 EVERGLADES			
Project Description									
Inputs									
Upstream Adj Ramp		Number of Lanes, N			2 ✓			Downstream Adj Ramp	
<input type="checkbox"/> Yes <input type="checkbox"/> On		Acceleration Lane Length, L _A			415			<input type="checkbox"/> Yes <input type="checkbox"/> On	
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off		Deceleration Lane Length L _D						<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	
L _{up} = ft		Freeway Volume, V _F			1036 ✓			L _{down} = ft	
V _u = veh/h		Ramp Volume, V _R			340 ✓			V _D = veh/h	
		Freeway Free-Flow Speed, S _{FF}			70.0 ✓				
		Ramp Free-Flow Speed, S _{FR}			35.0				
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	1036	0.90 ✓	Level	6	0	0.971	0.90 ✓	1317	
Ramp	340	0.90	Level	22	0	0.901	0.90 ✓	466	
UpStream									
DownStream									
Merge Areas					Diverge Areas				
Estimation of v₁₂					Estimation of v₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13)				
L _{EQ} =					L _{EQ} =				
P _{FM} = 1.000 using Equation (Exhibit 13-6)					P _{FD} = using Equation (Exhibit 13-7)				
V ₁₂ = 1317 pc/h					V ₁₂ = pc/h				
V ₃ or V _{av34} = 0 pc/h (Equation 13-14 or 13-17)					V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17)				
Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No				
Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No				
If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}	1783	Exhibit 13-8		No	V _F		Exhibit 13-8		
					V _{FO} = V _F - V _R		Exhibit 13-8		
					V _R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}	1783	Exhibit 13-8		No	V ₁₂		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$				
D _R = 16.6 (pc/mi/ln)					D _R = (pc/mi/ln)				
LOS = B (Exhibit 13-2)					LOS = (Exhibit 13-2)				

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: GSR
Agency/Co.: AIM ENGINEERING
Date performed: 3/27/2012
Analysis time period: PM
Freeway/Dir of Travel: I-75 EB
Junction: EVERGLADES BLVD OFF RAMP
Jurisdiction:
Analysis Year: 2019 EVERGLADES
Description:

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2289	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	659	vph
Length of first accel/decel lane	400	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2289	659		vph
Peak-hour factor, PHF	0.90	0.90		
Peak 15-min volume, v15	636	183		v
Trucks and buses	6	6		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5*	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.971	0.971	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2620	754	pcph

----- Estimation of V12 Diverge Areas -----

L = (Equation 25-8 or 25-9)
EQ
P = 1.000 Using Equation 0
FD
 $v_{12} = v_R + (v_F - v_R) P = 2620$ pc/h
FD

----- Capacity Checks -----

	Actual	Maximum	LOS F?
$v_{12} = v_{F1}$	2620	4800	No
$v_{12} = v_F - v_R$	1866	4800	No
v_R	754	2100	No
$v_{12} = v_{3 \text{ or } 4}$	0 pc/h	(Equation 25-15 or 25-16)	
Is $v_{12} > 2700$ pc/h?		No	
Is $v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} =$		(Equation 25-18)	

----- Flow Entering Diverge Influence Area -----

	Actual	Max Desirable	Violation?
v_{12}	2620	4600	No

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

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 23.2$ pc/mi/ln
Level of service for ramp-freeway junction areas of influence C

----- Speed Estimation -----

Intermediate speed variable,	D = 0.366	
Space mean speed in ramp influence area,	S = 59.8	mph
Space mean speed in outer lanes,	S = N/A	mph
Space mean speed for all vehicles,	S = 59.8	mph

Phone: Fax:
E-mail:

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

Analyst: GSR
 Agency/Co.: AIM ENGINEERING
 Date performed: 3/28/2012
 Analysis time period: PM
 Freeway/Dir of Travel: I-75 EB
 Junction: EVERGLADES BLVD EB ON
 Jurisdiction:
 Analysis Year: 2019 EVERGLADES
 Description:

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

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1630	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	121	vph
Length of first accel/decel lane	1200	ft
Length of second accel/decel lane		ft

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

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

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

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1630	121		vph
Peak-hour factor, PHF	0.90	0.90		
Peak 15-min volume, v15	453	34		v
Trucks and buses	6	6		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade		%	%	%
Length		mi	mi	mi
Trucks and buses PCE, ET	1.5*	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.971	0.971	
Driver population factor, fP	0.90	0.90	
Flow rate, vp	2073	154	pcph

----- Estimation of V12 Merge Areas -----

L = (Equation 25-2 or 25-3)
 EQ
 P = 1.000 Using Equation 0
 FM
 $v_{12} = v_F (P_{FM}) = 2073 \text{ pc/h}$

----- Capacity Checks -----

	Actual	Maximum	LOS F?
v _{FO}	2227	4800	No
v _{3 or av34}	0 pc/h	(Equation 25-4 or 25-5)	
Is v _{3 or av34} > 2700 pc/h?		No	
Is v _{3 or av34} > 1.5 v ₁₂ / 2		No	
If yes, v _{12A} =		(Equation 25-8)	

----- Flow Entering Merge Influence Area -----

	Actual	Max Desirable	Violation?
v ₁₂	2073	4400	No

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

Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 15.3 \text{ pc/mi/ln}$
 Level of service for ramp-freeway junction areas of influence B

----- Speed Estimation -----

Intermediate speed variable,	M = 0.273	
Space mean speed in ramp influence area,	S = 62.4	mph
Space mean speed in outer lanes,	S = N/A	mph
Space mean speed for all vehicles,	S = 62.4	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: GSR
 Agency/Co.: AIM ENGINEERING
 Date performed: 3/8/2012
 Analysis time period: PM
 Freeway/Dir of Travel: I-75 WB
 Junction: EVERGLADES BLVD OFF RAMP
 Jurisdiction:
 Analysis Year: 2019 EVERGLADES
 Description:

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1376	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	95	vph
Length of first accel/decel lane	400	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1376	95		vph
Peak-hour factor, PHF	0.90	0.90		
Peak 15-min volume, v15	382	26		v
Trucks and buses	6	6		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5*	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.971	0.971	
Driver population factor, fP	0.90	0.90	
Flow rate, vp	1750	121	pcph

----- Estimation of V12 Diverge Areas -----

L = (Equation 25-8 or 25-9)
 EQ
 P = 1.000 Using Equation 0
 FD
 $v_{12} = v_R + (v_F - v_R) P = 1750$ pc/h
 FD

----- Capacity Checks -----

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1750	4800	No
$v_{FO} = v_F - v_R$	1629	4800	No
v_R	121	2100	No
$v_{3 \text{ or } 34} = 0$ pc/h		(Equation 25-15 or 25-16)	
Is $v_{3 \text{ or } 34} > 2700$ pc/h?		No	
Is $v_{3 \text{ or } 34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} =$		(Equation 25-18)	

----- Flow Entering Diverge Influence Area -----

	Actual	Max Desirable	Violation?
v_{12}	1750	4600	No

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

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 15.7$ pc/mi/ln
 Level of service for ramp-freeway junction areas of influence B

----- Speed Estimation -----

Intermediate speed variable,	D = 0.309	
Space mean speed in ramp influence area,	S = 61.4	mph
Space mean speed in outer lanes,	S = N/A	mph
Space mean speed for all vehicles,	S = 61.4	mph

Phone: Fax:
E-mail:

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

Analyst: GSR
 Agency/Co.: AIM ENGINEERING
 Date performed: 3/28/2012
 Analysis time period: PM
 Freeway/Dir of Travel: I-75 WB
 Junction: EVERGLADES BLVD WB ON
 Jurisdiction:
 Analysis Year: 2019 EVERGLADES
 Description:

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

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1281	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	518	vph
Length of first accel/decel lane	1200	ft
Length of second accel/decel lane		ft

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

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

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

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1281	518		vph
Peak-hour factor, PHF	0.90	0.90		
Peak 15-min volume, v15	356	144		v
Trucks and buses	6	6		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade		%	%	%
Length		mi	mi	mi
Trucks and buses PCE, ET	1.5*	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.971	0.971	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	1466	593	pcph

----- Estimation of V12 Merge Areas -----

L = (Equation 25-2 or 25-3)
EQ
P = 1.000 Using Equation 0
FM
 $v_{12} = v_F (P_{FM}) = 1466 \text{ pc/h}$

----- Capacity Checks -----

	Actual	Maximum	LOS F?
v _{FO}	2059	4800	No
v _{3 or av34}	0 pc/h	(Equation 25-4 or 25-5)	
Is v _{3 or av34} > 2700 pc/h?		No	
Is v _{3 or av34} > 1.5 v ₁₂ / 2		No	
If yes, v _{12A} =		(Equation 25-8)	

----- Flow Entering Merge Influence Area -----

	Actual	Max Desirable	Violation?
v ₁₂	1466	4400	No

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

Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 13.7 \text{ pc/mi/ln}$
Level of service for ramp-freeway junction areas of influence B

----- Speed Estimation -----

Intermediate speed variable,	M = 0.268	
Space mean speed in ramp influence area,	S _R = 62.5	mph
Space mean speed in outer lanes,	S ₀ = N/A	mph
Space mean speed for all vehicles,	S = 62.5	mph

Phone: Fax:
E-mail:

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

Analyst: GSR
Agency/Co.: AIM ENGINEERING
Date performed: 4/4/2012
Analysis time period: PM
Freeway/Dir of Travel: I-75 EB
Junction: SR 951 OFF RAMP
Jurisdiction:
Analysis Year: 2019 EVERGLADES
Description:

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

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3545	vph

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

Side of freeway	Right	
Number of lanes in ramp	2	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	1859	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane	0	ft

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

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

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

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3545	1859		vph
Peak-hour factor, PHF	0.90	0.90		
Peak 15-min volume, v15	985	516		v
Trucks and buses	6	6		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5*	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.971	0.971	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	4057	2128	pcph

----- Estimation of V12 Diverge Areas -----

L = (Equation 25-8 or 25-9)
 EQ
 P = 1.000 Using Equation 0
 FD
 $v_{12} = v_R + (v_F - v_R) P = 4057$ pc/h
 FD

----- Capacity Checks -----

	Actual	Maximum	LOS F?
$v_{12} = v_{Fi}$	4057	4800	No
$v_{12} = v_F - v_R$	1929	4800	No
v_{12}	2128	4100	No
v_{12}	0 pc/h	(Equation 25-15 or 25-16)	
Is $v_{12} > 2700$ pc/h?		No	
Is $v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12} =$		(Equation 25-18)	

----- Flow Entering Diverge Influence Area -----

	Actual	Max Desirable	Violation?
v_{12}	4057	4600	No

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

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 30.1$ pc/mi/ln
 Level of service for ramp-freeway junction areas of influence D

----- Speed Estimation -----

Intermediate speed variable,	D = 0.490	
Space mean speed in ramp influence area,	S = 56.3	mph
Space mean speed in outer lanes,	S = N/A	mph
Space mean speed for all vehicles,	S = 56.3	mph

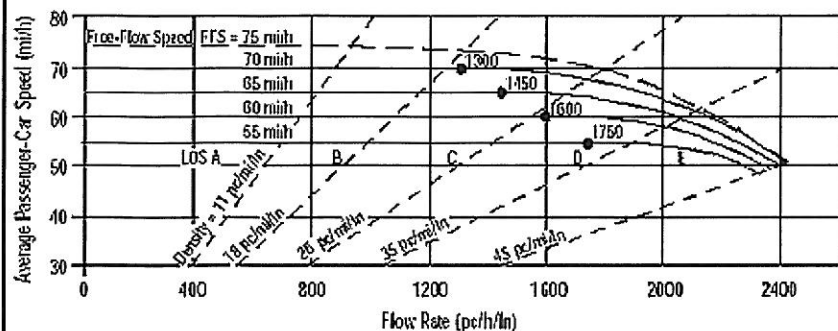
RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	AL				Freeway/Dir of Travel	I-75 EB			
Agency or Company	AIM ENGINEERING				Junction	SR 951 EB ON			
Date Performed	3/16/2012				Jurisdiction				
Analysis Time Period	PM				Analysis Year	2019 EVERGLADES			
Project Description									
Inputs									
Upstream Adj Ramp		Number of Lanes, N			2			Downstream Adj Ramp	
<input type="checkbox"/> Yes <input type="checkbox"/> On		Acceleration Lane Length, L _A			465			<input type="checkbox"/> Yes <input type="checkbox"/> On	
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off		Deceleration Lane Length L _D						<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	
L _{up} = ft		Freeway Volume, V _F			1686			L _{down} = ft	
V _u = veh/h		Ramp Volume, V _R			603			V _D = veh/h	
		Freeway Free-Flow Speed, S _{FF}			70.0				
		Ramp Free-Flow Speed, S _{FR}			35.0				
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	1686	0.90	Level	6	0	0.971	1.00	1930	
Ramp	603	0.90	Level	6	0	0.971	1.00	690	
UpStream									
DownStream									
Merge Areas					Diverge Areas				
Estimation of v₁₂					Estimation of v₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 1.000 using Equation (Exhibit 13-6) V ₁₂ = 1930 pc/h V ₃ or V _{av34} = 0 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = using Equation (Exhibit 13-7) V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}	2620	Exhibit 13-8		No	V _F		Exhibit 13-8		
					V _{FO} = V _F - V _R		Exhibit 13-8		
					V _R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}	2620	Exhibit 13-8		No	V ₁₂		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 22.7 (pc/mi/ln) LOS = C (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	AL				Freeway/Dir of Travel	I-75 WB			
Agency or Company	AIM ENGINEERING				Junction	SR 951 OFF RAMP			
Date Performed	3/8/2012				Jurisdiction				
Analysis Time Period	PM				Analysis Year	2019 EVERGLADES			
Project Description									
Inputs									
Upstream Adj Ramp		Number of Lanes, N			2 ✓			Downstream Adj Ramp	
<input type="checkbox"/> Yes <input type="checkbox"/> On		Acceleration Lane Length, L _A						<input type="checkbox"/> Yes <input type="checkbox"/> On	
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off		Deceleration Lane Length L _D			220			<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	
L _{up} = ft		Freeway Volume, V _F			1799 ✓			L _{down} = ft	
V _u = veh/h		Ramp Volume, V _R			474 ✓			V _D = veh/h	
		Freeway Free-Flow Speed, S _{FF}			70.0 ✓				
		Ramp Free-Flow Speed, S _{FR}			45.0 ✓				
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	1799	0.90 ✓	Level	6	0	0.971	1.00 ✓	2059	
Ramp	474	0.90 ✓	Level	6	0	0.971	1.00 ✓	542	
UpStream									
DownStream									
Merge Areas					Diverge Areas				
Estimation of v₁₂					Estimation of v₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = 1.000 using Equation (Exhibit 13-7) V ₁₂ = 2059 pc/h V ₃ or V _{av34} 0 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	2059	Exhibit 13-8	4800	No
				V _{FO} = V _F - V _R	1517	Exhibit 13-8	4800	No	
				V _R	542	Exhibit 13-10	2100	No	
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}		Exhibit 13-8			V ₁₂	2059	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = 20.0 (pc/mi/ln) LOS = B (Exhibit 13-2)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	AL				Freeway/Dir of Travel	I-75 WB			
Agency or Company	AIM ENGINEERING				Junction	SR 951 WB ON			
Date Performed	3/16/2012				Jurisdiction				
Analysis Time Period	PM				Analysis Year	2019 EVERGLADES			
Project Description									
Inputs									
Upstream Adj Ramp		Number of Lanes, N			2 ✓			Downstream Adj Ramp	
<input type="checkbox"/> Yes <input type="checkbox"/> On		Acceleration Lane Length, L _A			385			<input type="checkbox"/> Yes <input type="checkbox"/> On	
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off		Deceleration Lane Length L _D						<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	
L _{up} = ft		Freeway Volume, V _F			1325 ✓			L _{down} = ft	
V _u = veh/h		Ramp Volume, V _R			1461 ✓			V _D = veh/h	
		Freeway Free-Flow Speed, S _{FF}			70.0 ✓				
		Ramp Free-Flow Speed, S _{FR}			35.0				
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	1325	0.90 ✓	Level	6	0	0.971	1.00 ✓	1516	
Ramp	1461	0.90	Level	6	0	0.971	1.00 ✓	1672	
UpStream									
DownStream									
Merge Areas					Diverge Areas				
Estimation of v₁₂					Estimation of v₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 1.000 using Equation (Exhibit 13-6) V ₁₂ = 1516 pc/h V ₃ or V _{av34} = 0 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = using Equation (Exhibit 13-7) V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}	3188	Exhibit 13-8		No	V _F		Exhibit 13-8		
					V _{FO} = V _F - V _R		Exhibit 13-8		
					V _R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}	3188	Exhibit 13-8		No	V ₁₂		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 27.2 (pc/mi/ln) LOS = C (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)				

RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Information					Site Information					
Analyst	AL				Freeway/Dir of Travel	I-75 NB				
Agency or Company	AIM ENGINEERING				Junction	GGP NB OFF RAMP				
Date Performed	3/8/2012				Jurisdiction					
Analysis Time Period	PM				Analysis Year	2019 EVERGLADES				
Project Description										
Inputs										
Upstream Adj Ramp	Number of Lanes, N				3 ✓		Downstream Adj Ramp			
<input type="checkbox"/> Yes <input type="checkbox"/> On	Acceleration Lane Length, L _A						<input type="checkbox"/> Yes <input type="checkbox"/> On			
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Deceleration Lane Length L _D				310		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off			
L _{up} = ft	Freeway Volume, V _F				2786 ✓		L _{down} = ft			
V _u = veh/h	Ramp Volume, V _R				438 ✓		V _D = veh/h			
	Freeway Free-Flow Speed, S _{FF}				70.0 ✓					
	Ramp Free-Flow Speed, S _{FR}				45.0 ✓					
Conversion to pc/h Under Base Conditions										
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p		
Freeway	2786	0.90 ✓	Level	6	0	0.971	1.00 ✓	3188		
Ramp	438	0.90 ✓	Level	6	0	0.971	1.00 ✓	501		
UpStream										
DownStream										
Merge Areas					Diverge Areas					
Estimation of v ₁₂					Estimation of v ₁₂					
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = 0.657 using Equation (Exhibit 13-7) V ₁₂ = 2267 pc/h V ₃ or V _{av34} 921 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					
Capacity Checks					Capacity Checks					
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?	
V _{FO}		Exhibit 13-8			V _F	3188	Exhibit 13-8	7200	No	
					V _{FO} = V _F - V _R	2687	Exhibit 13-8	7200	No	
					V _R	501	Exhibit 13-10	2100	No	
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area					
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?	
V _{R12}		Exhibit 13-8			V ₁₂	2267	Exhibit 13-8	4400:All	No	
Level of Service Determination (if not F)					Level of Service Determination (if not F)					
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = 21.0 (pc/mi/ln) LOS = C (Exhibit 13-2)					

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v _p	LOS, S, D
Design (N)	FFS, LOS, v _p	N, S, D
Design (v _p)	FFS, LOS, N	v _p , S, D
Planning (LOS)	FFS, N, AADT	LOS, S, D
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v _p)	FFS, LOS, N	v _p , S, D

General Information		Site Information	
Analyst	GSR	Highway/Direction of Travel	I-75
Agency or Company	AIM ENGINEERING	From/To	BTWN NB GG PKW ON/OFF-RAMPS
Date Performed	3/26/2012	Jurisdiction	
Analysis Time Period	PM	Analysis Year	2019 EVERGLADES
Project Description EVERGLADES IJR			

Oper.(LOS)
 Des.(N)
 Planning Data

Flow Inputs			
Volume, V	2348	veh/h	Peak-Hour Factor, PHF
AADT		veh/day	% Trucks and Buses, P _T
Peak-Hr Prop. of AADT, K			% RVs, P _R
Peak-Hr Direction Prop, D			General Terrain:
DDHV = AADT x K x D		veh/h	Grade % Length
Driver type adjustment	1.00		Up/Down %

Calculate Flow Adjustments			
f _p	1.00	E _R	1.2
E _T	1.5	f _{HV} = 1/[1+P _T (E _T -1) + P _R (E _R -1)]	0.971

Speed Inputs		Calc Speed Adj and FFS		
Lane Width	12.0 ft	f _{LW}	0.0	mi/h
Rt-Shoulder Lat. Clearance	6.0 ft	f _{LC}	0.0	mi/h
Interchange Density	0.50 l/mi	f _{ID}	0.0	mi/h
Number of Lanes, N	2	f _N	4.5	mi/h
FFS (measured)		FFS	70.5	mi/h
Base free-flow Speed, BFFS	75.0 mi/h			

LOS and Performance Measures		Design (N)	
<u>Operational (LOS)</u>		<u>Design (N)</u>	
v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	1344 pc/h/ln	Design LOS	
S	70.5 mi/h	v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h
D = v _p / S	19.1 pc/mi/ln	S	mi/h
LOS	C	D = v _p / S	pc/mi/ln
		Required Number of Lanes, N	

Glossary		Factor Location	
N - Number of lanes	S - Speed	E _R - Exhibits 23-8, 23-10	f _{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E _T - Exhibits 23-8, 23-10, 23-11	f _{LC} - Exhibit 23-5
v _p - Flow rate	FFS - Free-flow speed	f _p - Page 23-12	f _N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v _p - Exhibits 23-2, 23-3	f _{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

BASIC FREEWAY SEGMENTS WORKSHEET																								
	<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Application</th> <th style="text-align: left;">Input</th> <th style="text-align: left;">Output</th> </tr> </thead> <tbody> <tr> <td>Operational (LOS)</td> <td>FFS, N, v_p</td> <td>LOS, S, D</td> </tr> <tr> <td>Design (N)</td> <td>FFS, LOS, v_p</td> <td>N, S, D</td> </tr> <tr> <td>Design (v_p)</td> <td>FFS, LOS, N</td> <td>v_p, S, D</td> </tr> <tr> <td>Planning (LOS)</td> <td>FFS, N, AADT</td> <td>LOS, S, D</td> </tr> <tr> <td>Planning (N)</td> <td>FFS, LOS, AADT</td> <td>N, S, D</td> </tr> <tr> <td>Planning (v_p)</td> <td>FFS, LOS, N</td> <td>v_p, S, D</td> </tr> </tbody> </table>			Application	Input	Output	Operational (LOS)	FFS, N, v_p	LOS, S, D	Design (N)	FFS, LOS, v_p	N, S, D	Design (v_p)	FFS, LOS, N	v_p , S, D	Planning (LOS)	FFS, N, AADT	LOS, S, D	Planning (N)	FFS, LOS, AADT	N, S, D	Planning (v_p)	FFS, LOS, N	v_p , S, D
Application	Input	Output																						
Operational (LOS)	FFS, N, v_p	LOS, S, D																						
Design (N)	FFS, LOS, v_p	N, S, D																						
Design (v_p)	FFS, LOS, N	v_p , S, D																						
Planning (LOS)	FFS, N, AADT	LOS, S, D																						
Planning (N)	FFS, LOS, AADT	N, S, D																						
Planning (v_p)	FFS, LOS, N	v_p , S, D																						
General Information		Site Information																						
Analyst	AL	Highway/Direction of Travel	I-75																					
Agency or Company	AIM ENGINEERING	From/To	N OF GG PKWY_NB																					
Date Performed	3/6/2012	Jurisdiction																						
Analysis Time Period	PM	Analysis Year	2019 EVERGLADES																					
Project Description EVERGLADES IJR																								
<input checked="" type="checkbox"/> Oper.(LOS) <input type="checkbox"/> Des.(N) <input type="checkbox"/> Planning Data																								
Flow Inputs																								
Volume, V	4360	veh/h	Peak-Hour Factor, PHF																					
AADT		veh/day	%Trucks and Buses, P_T																					
Peak-Hr Prop. of AADT, K			%RVs, P_R																					
Peak-Hr Direction Prop, D			General Terrain:																					
DDHV = AADT x K x D		veh/h	Grade % Length																					
Driver type adjustment	1.00		Up/Down %																					
Calculate Flow Adjustments																								
f_p	1.00	E_R	1.2																					
E_T	1.5	$f_{HV} = 1/(1+P_T(E_T - 1) + P_R(E_R - 1))$	0.971																					
Speed Inputs		Calc Speed Adj and FFS																						
Lane Width	12.0	ft	f_{LW}																					
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}																					
Interchange Density	0.50	l/mi	f_{ID}																					
Number of Lanes, N	3		f_N																					
FFS (measured)		mi/h	FFS																					
Base free-flow Speed, BFFS	75.0	mi/h	72.0																					
LOS and Performance Measures		Design (N)																						
<u>Operational (LOS)</u>		<u>Design (N)</u>																						
$v_p = (V \text{ or } DDHV) / (PHF \times N \times f_{HV} \times f_p)$	1663	pc/h/ln	Design LOS																					
S	70.6	mi/h	$v_p = (V \text{ or } DDHV) / (PHF \times N \times f_{HV} \times f_p)$																					
$D = v_p / S$	23.5	pc/mi/ln	S																					
LOS	C		$D = v_p / S$																					
		Required Number of Lanes, N																						
Glossary		Factor Location																						
N - Number of lanes	S - Speed	E_R - Exhibits 23-8, 23-10	f_{LW} - Exhibit 23-4																					
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5																					
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6																					
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7																					
DDHV - Directional design hour volume																								

BASIC FREEWAY SEGMENTS WORKSHEET																						
<p>The graph plots Average Passenger-Car Speed (mi/h) on the y-axis (30 to 80) against Flow Rate (pc/h/ln) on the x-axis (0 to 2400). It shows several curves representing different density levels: 11 pc/mi/ln, 18 pc/mi/ln, 25 pc/mi/ln, 35 pc/mi/ln, and 45 pc/mi/ln. Points A, B, C, D, and E are marked on the curves, corresponding to different levels of service (LOS).</p>	<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Application</th> <th style="text-align: left;">Input</th> <th style="text-align: left;">Output</th> </tr> </thead> <tbody> <tr> <td>Operational (LOS)</td> <td>FFS, N, v_p</td> <td>LOS, S, D</td> </tr> <tr> <td>Design (N)</td> <td>FFS, LOS, v_p</td> <td>N, S, D</td> </tr> <tr> <td>Design (v_p)</td> <td>FFS, LOS, N</td> <td>v_p, S, D</td> </tr> <tr> <td>Planning (LOS)</td> <td>FFS, N, AADT</td> <td>LOS, S, D</td> </tr> <tr> <td>Planning (N)</td> <td>FFS, LOS, AADT</td> <td>N, S, D</td> </tr> <tr> <td>Planning (v_p)</td> <td>FFS, LOS, N</td> <td>v_p, S, D</td> </tr> </tbody> </table>	Application	Input	Output	Operational (LOS)	FFS, N, v_p	LOS, S, D	Design (N)	FFS, LOS, v_p	N, S, D	Design (v_p)	FFS, LOS, N	v_p , S, D	Planning (LOS)	FFS, N, AADT	LOS, S, D	Planning (N)	FFS, LOS, AADT	N, S, D	Planning (v_p)	FFS, LOS, N	v_p , S, D
Application	Input	Output																				
Operational (LOS)	FFS, N, v_p	LOS, S, D																				
Design (N)	FFS, LOS, v_p	N, S, D																				
Design (v_p)	FFS, LOS, N	v_p , S, D																				
Planning (LOS)	FFS, N, AADT	LOS, S, D																				
Planning (N)	FFS, LOS, AADT	N, S, D																				
Planning (v_p)	FFS, LOS, N	v_p , S, D																				
General Information		Site Information																				
Analyst	AL	Highway/Direction of Travel	I-75																			
Agency or Company	AIM ENGINEERING	From/To	N OF GG PKWY_SB																			
Date Performed	3/6/2012	Jurisdiction																				
Analysis Time Period	PM	Analysis Year	2019 EVERGLADES																			
Project Description EVERGLADES IJR																						
<input type="checkbox"/> Oper.(LOS) <input type="checkbox"/> Des.(N) <input type="checkbox"/> Planning Data																						
Flow Inputs																						
Volume, V	4514	veh/h	Peak-Hour Factor, PHF																			
AADT		veh/day	%Trucks and Buses, P_T																			
Peak-Hr Prop. of AADT, K			%RVs, P_R																			
Peak-Hr Direction Prop, D			General Terrain:																			
DDHV = AADT x K x D		veh/h	Grade % Length																			
Driver type adjustment	1.00		Up/Down %																			
Calculate Flow Adjustments																						
f_p	1.00	E_R	1.2																			
E_T	1.5	$f_{HV} = 1 / (1 + P_T(E_T - 1) + P_R(E_R - 1))$	0.971																			
Speed Inputs		Calc Speed Adj and FFS																				
Lane Width	12.0	ft	f_{LW}																			
Rt-Shoulder Lat. Clearance	6.0	ft	0.0																			
Interchange Density	0.50	l/mi	f_{LC}																			
Number of Lanes, N	3		0.0																			
FFS (measured)		mi/h	f_{ID}																			
Base free-flow Speed, BFFS	75.0	mi/h	0.0																			
			f_N																			
			3.0																			
			FFS																			
			72.0																			
LOS and Performance Measures		Design (N)																				
<u>Operational (LOS)</u>		<u>Design (N)</u>																				
$v_p = (V \text{ or } DDHV) / (PHF \times N \times f_{HV} \times f_p)$	1722	Design LOS																				
S	70.1	$v_p = (V \text{ or } DDHV) / (PHF \times N \times f_{HV} \times f_p)$	pc/h																			
$D = v_p / S$	24.6	S	mi/h																			
LOS	C	$D = v_p / S$	pc/mi/ln																			
		Required Number of Lanes, N																				
Glossary		Factor Location																				
N - Number of lanes	S - Speed	E_R - Exhibits 23-8, 23-10	f_{LW} - Exhibit 23-4																			
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5																			
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6																			
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7																			
DDHV - Directional design hour volume																						

BASIC FREEWAY SEGMENTS WORKSHEET																						
<p>The graph plots Average Passenger-Car Speed (mi/h) on the y-axis (30 to 80) against Flow Rate (pc/h/ln) on the x-axis (0 to 2400). A solid line represents the Free-Flow Speed (FFS) at 75 mi/h. Dashed lines represent Level of Service (LOS) curves for A, B, C, D, and E. Density curves are also shown: 11 pc/mi/ln, 18 pc/mi/ln, 26 pc/mi/ln, 35 pc/mi/ln, and 45 pc/mi/ln. Data points are plotted at flow rates of 1300, 1450, 1600, and 1750 pc/h/ln.</p>	<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Application</th> <th style="text-align: left;">Input</th> <th style="text-align: left;">Output</th> </tr> </thead> <tbody> <tr> <td>Operational (LOS)</td> <td>FFS, N, v_p</td> <td>LOS, S, D</td> </tr> <tr> <td>Design (N)</td> <td>FFS, LOS, v_p</td> <td>N, S, D</td> </tr> <tr> <td>Design (v_p)</td> <td>FFS, LOS, N</td> <td>v_p, S, D</td> </tr> <tr> <td>Planning (LOS)</td> <td>FFS, N, AADT</td> <td>LOS, S, D</td> </tr> <tr> <td>Planning (N)</td> <td>FFS, LOS, AADT</td> <td>N, S, D</td> </tr> <tr> <td>Planning (v_p)</td> <td>FFS, LOS, N</td> <td>v_p, S, D</td> </tr> </tbody> </table>	Application	Input	Output	Operational (LOS)	FFS, N, v_p	LOS, S, D	Design (N)	FFS, LOS, v_p	N, S, D	Design (v_p)	FFS, LOS, N	v_p , S, D	Planning (LOS)	FFS, N, AADT	LOS, S, D	Planning (N)	FFS, LOS, AADT	N, S, D	Planning (v_p)	FFS, LOS, N	v_p , S, D
Application	Input	Output																				
Operational (LOS)	FFS, N, v_p	LOS, S, D																				
Design (N)	FFS, LOS, v_p	N, S, D																				
Design (v_p)	FFS, LOS, N	v_p , S, D																				
Planning (LOS)	FFS, N, AADT	LOS, S, D																				
Planning (N)	FFS, LOS, AADT	N, S, D																				
Planning (v_p)	FFS, LOS, N	v_p , S, D																				
General Information		Site Information																				
Analyst	GSR	Highway/Direction of Travel	I-75																			
Agency or Company	AIM ENGINEERING	From/To	BTWN SB GG PKW ON/OFF-RAMPS																			
Date Performed	3/26/2012	Jurisdiction																				
Analysis Time Period	PM	Analysis Year	2019 EVERGLADES																			
Project Description EVERGLADES IJR																						
<input type="checkbox"/> Oper.(LOS)		<input type="checkbox"/> Des.(N)																				
<input type="checkbox"/> Planning Data																						
Flow Inputs																						
Volume, V	2989	veh/h	Peak-Hour Factor, PHF																			
AADT		veh/day	% Trucks and Buses, P_T																			
Peak-Hr Prop. of AADT, K			% RVs, P_R																			
Peak-Hr Direction Prop, D			General Terrain:																			
DDHV = AADT x K x D		veh/h	Grade % Length																			
Driver type adjustment	1.00		Up/Down %																			
Calculate Flow Adjustments																						
f_p	1.00	E_R	1.2																			
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.971																			
Speed Inputs		Calc Speed Adj and FFS																				
Lane Width	12.0	ft	f_{LW}																			
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}																			
Interchange Density	0.50	l/mi	f_{ID}																			
Number of Lanes, N	2		f_N																			
FFS (measured)		mi/h	FFS																			
Base free-flow Speed, BFFS	75.0	mi/h	70.5																			
LOS and Performance Measures		Design (N)																				
<u>Operational (LOS)</u>		<u>Design (N)</u>																				
$v_p = (V \text{ or } DDHV) / (PHF \times N \times f_{HV} \times f_p)$	1710	pc/h/ln	Design LOS																			
S	69.1	mi/h	$v_p = (V \text{ or } DDHV) / (PHF \times N \times f_{HV} \times f_p)$																			
$D = v_p / S$	24.7	pc/mi/ln	S																			
LOS	C		$D = v_p / S$																			
		Required Number of Lanes, N																				
Glossary		Factor Location																				
N - Number of lanes	S - Speed	E_R - Exhibits 23-8, 23-10	f_{LW} - Exhibit 23-4																			
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5																			
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6																			
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7																			
DDHV - Directional design hour volume																						

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	AL	Freeway/Dir of Travel	I-75 SB						
Agency or Company	AIM ENGINEERING	Junction	GOLDEN GATE PKWY SB ON						
Date Performed	3/16/2012	Jurisdiction							
Analysis Time Period	PM	Analysis Year	2019 EVERGLADES						
Project Description									
Inputs									
Upstream Adj Ramp	Number of Lanes, N	3 ✓	Downstream Adj Ramp						
<input type="checkbox"/> Yes <input type="checkbox"/> On	Acceleration Lane Length, L _A	550	<input type="checkbox"/> Yes <input type="checkbox"/> On						
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Deceleration Lane Length L _D		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off						
L _{up} = ft	Freeway Volume, V _F	2989 ✓	L _{down} = ft						
V _u = veh/h	Ramp Volume, V _R	556 ✓	V _D = veh/h						
	Freeway Free-Flow Speed, S _{FF}	70.0 ✓							
	Ramp Free-Flow Speed, S _{FR}	35.0 ✓							
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	2989	0.90 ✓	Level	6	0	0.971	1.00 ✓	3421	
Ramp	556	0.90 ✓	Level	6	0	0.971	1.00 ✓	636	
UpStream									
DownStream									
Merge Areas					Diverge Areas				
Estimation of v₁₂					Estimation of v₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 0.593 using Equation (Exhibit 13-6) V ₁₂ = 2028 pc/h V ₃ or V _{av34} = 1393 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = using Equation (Exhibit 13-7) V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?		
V _{FO}	4057	Exhibit 13-8	No	V _F		Exhibit 13-8			
				V _{FO} = V _F - V _R		Exhibit 13-8			
				V _R		Exhibit 13-10			
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?		
V _{R12}	2664	Exhibit 13-8	4600:All	No	V ₁₂	Exhibit 13-8			
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 22.5 (pc/mi/ln) LOS = C (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	AL	Freeway/Dir of Travel	I-75 EB		Agency or Company	AIM ENGINEERING	Junction	SR 29 OFF RAMP	
Date Performed	3/21/2012	Jurisdiction			Analysis Time Period	AM	Analysis Year	2019 DESOTO	
Project Description									
Inputs									
Upstream Adj Ramp	Number of Lanes, N		2 ✓		Downstream Adj Ramp				
<input type="checkbox"/> Yes <input type="checkbox"/> On	Acceleration Lane Length, L _A				<input type="checkbox"/> Yes <input type="checkbox"/> On				
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Deceleration Lane Length L _D		202		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off				
L _{up} = ft	Freeway Volume, V _F		1384 ✓		L _{down} = ft				
V _u = veh/h	Ramp Volume, V _R		342 ✓		V _D = veh/h				
	Freeway Free-Flow Speed, S _{FF}		70.0 ✓						
	Ramp Free-Flow Speed, S _{FR}		45.0 ✓						
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	1384	0.90 ✓	Level	6	0	0.971	0.90 ✓	1760	
Ramp	342	0.90 ✓	Level	22	0	0.901	0.90 ✓	469	
UpStream									
DownStream									
Merge Areas					Diverge Areas				
Estimation of v₁₂					Estimation of v₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = 1.000 using Equation (Exhibit 13-7) V ₁₂ = 1760 pc/h V ₃ or V _{av34} 0 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	1760	Exhibit 13-8	4800	No
					V _{FO} = V _F - V _R	1291	Exhibit 13-8	4800	No
					V _R	469	Exhibit 13-10	2100	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}		Exhibit 13-8			V ₁₂	1760	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = 17.6 (pc/mi/ln) LOS = B (Exhibit 13-2)				

RAMPS AND RAMP JUNCTIONS WORKSHEET											
General Information					Site Information						
Analyst	AL				Freeway/Dir of Travel	I-75 EB					
Agency or Company	AIM ENGINEERING				Junction	SR 29 EB ON					
Date Performed	3/16/2012				Jurisdiction						
Analysis Time Period	AM				Analysis Year	2019 DESOTO					
Project Description											
Inputs											
Upstream Adj Ramp		Number of Lanes, N			2 ✓			Downstream Adj Ramp			
<input type="checkbox"/> Yes <input type="checkbox"/> On		Acceleration Lane Length, L _A			560			<input type="checkbox"/> Yes <input type="checkbox"/> On			
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off		Deceleration Lane Length L _D						<input checked="" type="checkbox"/> No <input type="checkbox"/> Off			
L _{up} =	ft		Freeway Volume, V _F			1042 ✓			L _{down} =	ft	
V _u =	veh/h		Ramp Volume, V _R			151 ✓			V _D =	veh/h	
			Freeway Free-Flow Speed, S _{FF}			70.0 ✓					
			Ramp Free-Flow Speed, S _{FR}			35.0					
Conversion to pc/h Under Base Conditions											
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p			
Freeway	1042	0.90 ✓	Level	6	0	0.971	0.90 ✓	1325			
Ramp	151	0.90 ✓	Level	22	0	0.901	0.90 ✓	207			
UpStream											
DownStream											
Merge Areas					Diverge Areas						
Estimation of v₁₂					Estimation of v₁₂						
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 1.000 using Equation (Exhibit 13-6) V ₁₂ = 1325 pc/h V ₃ or V _{av34} = 0 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = using Equation (Exhibit 13-7) V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)						
Capacity Checks					Capacity Checks						
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?		
V _{FO}	1532	Exhibit 13-8		No	V _F		Exhibit 13-8				
					V _{FO} = V _F - V _R		Exhibit 13-8				
					V _R		Exhibit 13-10				
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area						
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?		
V _{R12}	1532	Exhibit 13-8		No	V ₁₂		Exhibit 13-8				
Level of Service Determination (if not F)					Level of Service Determination (if not F)						
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 13.8 (pc/mi/ln) LOS = B (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)						

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	AL				Freeway/Dir of Travel	I-75 WB			
Agency or Company	AIM ENGINEERING				Junction	SR 29 OFF RAMP			
Date Performed	3/21/2012				Jurisdiction				
Analysis Time Period	AM				Analysis Year	2019 DESOTO			
Project Description									
Inputs									
Upstream Adj Ramp		Number of Lanes, N			2 ✓			Downstream Adj Ramp	
<input type="checkbox"/> Yes <input type="checkbox"/> On		Acceleration Lane Length, L _A						<input type="checkbox"/> Yes <input type="checkbox"/> On	
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off		Deceleration Lane Length L _D			215			<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	
L _{up} = ft		Freeway Volume, V _F			1518 ✓			L _{down} = ft	
V _u = veh/h		Ramp Volume, V _R			193 ✓			V _D = veh/h	
		Freeway Free-Flow Speed, S _{FF}			70.0 ✓				
		Ramp Free-Flow Speed, S _{FR}			45.0 ✓				
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	1518	0.90 ✓	Level	6	0	0.971	0.90 ✓	1930	
Ramp	193	0.90	Level	22	0	0.901	0.90	264	
UpStream									
DownStream									
Merge Areas					Diverge Areas				
Estimation of v₁₂					Estimation of v₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = 1.000 using Equation (Exhibit 13-7) V ₁₂ = 1930 pc/h V ₃ or V _{av34} = 0 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	1930	Exhibit 13-8	4800	No
					V _{FO} = V _F - V _R	1666	Exhibit 13-8	4800	No
					V _R	264	Exhibit 13-10	2100	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}		Exhibit 13-8			V ₁₂	1930	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = 18.9 (pc/mi/ln) LOS = B (Exhibit 13-2)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	AL				Freeway/Dir of Travel	I-75 WB			
Agency or Company	AIM ENGINEERING				Junction	SR 29 WB ON			
Date Performed	3/16/2012				Jurisdiction				
Analysis Time Period	AM				Analysis Year	2019 DESOTO			
Project Description									
Inputs									
Upstream Adj Ramp		Number of Lanes, N			2 ✓			Downstream Adj Ramp	
<input type="checkbox"/> Yes <input type="checkbox"/> On		Acceleration Lane Length, L _A			415			<input type="checkbox"/> Yes <input type="checkbox"/> On	
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off		Deceleration Lane Length L _D						<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	
L _{up} = ft		Freeway Volume, V _F			1325 ✓			L _{down} = ft	
V _u = veh/h		Ramp Volume, V _R			436 ✓			V _D = veh/h	
		Freeway Free-Flow Speed, S _{FF}			70.0 ✓				
		Ramp Free-Flow Speed, S _{FR}			35.0				
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	1325	0.90 ✓	Level	6	0	0.971	0.90 ✓	1685	
Ramp	436	0.90 ✓	Level	22	0	0.901	0.90	597	
UpStream									
DownStream									
Merge Areas					Diverge Areas				
Estimation of v₁₂					Estimation of v₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13)				
L _{EQ} =					L _{EQ} =				
P _{FM} = 1.000 using Equation (Exhibit 13-6)					P _{FD} = using Equation (Exhibit 13-7)				
V ₁₂ = 1685 pc/h					V ₁₂ = pc/h				
V ₃ or V _{av34} = 0 pc/h (Equation 13-14 or 13-17)					V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17)				
Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No				
Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No				
If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}	2282	Exhibit 13-8		No	V _F		Exhibit 13-8		
					V _{FO} = V _F - V _R		Exhibit 13-8		
					V _R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}	2282	Exhibit 13-8	4600:All	No	V ₁₂		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 20.4 (pc/mi/ln)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln)				
LOS = C (Exhibit 13-2)					LOS = (Exhibit 13-2)				

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: GSR
Agency/Co.: AIM ENGINEERING
Date performed: 3/28/2012
Analysis time period: AM
Freeway/Dir of Travel: I-75 EB
Junction: DESOTO BLVD OFF RAMP
Jurisdiction:
Analysis Year: 2019 DESOTO
Description:

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1727	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	447	vph
Length of first accel/decel lane	400	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1727	447		vph
Peak-hour factor, PHF	0.90	0.90		
Peak 15-min volume, v15	480	124		v
Trucks and buses	6	6		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5*	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.971	0.971	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	1976	512	pcph

Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)
 EQ
 P = 1.000 Using Equation 0
 FD
 $v_{12} = v_R + (v_F - v_R) P = 1976$ pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1976	4800	No
$v_{FO} = v_F - v_R$	1464	4800	No
v_R	512	2100	No
$v_{3 \text{ or } 34} = 0$ pc/h		(Equation 25-15 or 25-16)	
Is $v_{3 \text{ or } 34} > 2700$ pc/h?		No	
Is $v_{3 \text{ or } 34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} =$		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	1976	4600	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 17.6$ pc/mi/ln
 Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	D = 0.344	
Space mean speed in ramp influence area,	S = 60.4	mph
Space mean speed in outer lanes,	S = N/A	mph
Space mean speed for all vehicles,	S = 60.4	mph

Phone: Fax:
E-mail:

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

Analyst: GSR
Agency/Co.: AIM ENGINEERING
Date performed: 3/28/2012
Analysis time period: AM
Freeway/Dir of Travel: I-75 EB
Junction: DESOTO BLVD EB ON
Jurisdiction:
Analysis Year: 2019 DESOTO
Description:

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

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1280	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	104	vph
Length of first accel/decel lane	1200	ft
Length of second accel/decel lane		ft

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

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

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

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1280	104		vph
Peak-hour factor, PHF	0.90	0.90		
Peak 15-min volume, v15	356	29		v
Trucks and buses	6	6		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	%
Length	mi	mi	mi	mi
Trucks and buses PCE, ET	1.5*	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.971	0.971	
Driver population factor, fP	0.90	0.90	
Flow rate, vp	1628	132	pcph

Estimation of V12 Merge Areas

L = (Equation 25-2 or 25-3)
 EQ
 P = 1.000 Using Equation 0
 FM
 $v_{12} = v_{F \text{ FM}} = 1628 \text{ pc/h}$

Capacity Checks

	Actual	Maximum	LOS F?
v _{FO}	1760	4800	No
v _{3 or av34}	0 pc/h	(Equation 25-4 or 25-5)	
Is v _{3 or av34} > 2700 pc/h?		No	
Is v _{3 or av34} > 1.5 v ₁₂ / 2		No	
If yes, v _{12A} =		(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v ₁₂	1628	4400	No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 11.6 \text{ pc/mi/ln}$
 Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M = 0.260	
Space mean speed in ramp influence area,	S _R = 62.7	mph
Space mean speed in outer lanes,	S ₀ = N/A	mph
Space mean speed for all vehicles,	S = 62.7	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: GSR
 Agency/Co.: AIM ENGINEERING
 Date performed: 3/28/2012
 Analysis time period: AM
 Freeway/Dir of Travel: I-75 WB
 Junction: DESOTO BLVD OFF RAMP
 Jurisdiction:
 Analysis Year: 2019 DESOTO
 Description:

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1761	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	132	vph
Length of first accel/decel lane	400	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1761	132		vph
Peak-hour factor, PHF	0.90	0.90		
Peak 15-min volume, v15	489	37		v
Trucks and buses	6	6		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5*	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.971	0.971	
Driver population factor, fP	0.90	0.90	
Flow rate, vp	2239	168	pcph

 Estimation of V12 Diverge Areas

L = (Equation 25-8 or 25-9)
 EQ
 P = 1.000 Using Equation 0
 FD
 $v_{12} = v_R + (v_F - v_R) P = 2239$ pc/h
 FD

 Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2239	4800	No
$v_{FO} = v_F - v_R$	2071	4800	No
v_R	168	2100	No
$v_{3 \text{ or } av34}$	0 pc/h	(Equation 25-15 or 25-16)	
Is $v_{3 \text{ or } av34} > 2700$ pc/h?		No	
Is $v_{3 \text{ or } av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} =$		(Equation 25-18)	

 Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	2239	4600	No

 Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 19.9$ pc/mi/ln
 Level of service for ramp-freeway junction areas of influence B

 Speed Estimation

Intermediate speed variable,	D = 0.313	
Space mean speed in ramp influence area,	S = 61.2	mph
Space mean speed in outer lanes,	S = N/A	mph
Space mean speed for all vehicles,	S = 61.2	mph

Phone: Fax:
E-mail:

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

Analyst: GSR
Agency/Co.: AIM ENGINEERING
Date performed: 3/28/2012
Analysis time period: AM
Freeway/Dir of Travel: I-75 WB
Junction: DESOTO BLVD WB ON
Jurisdiction:
Analysis Year: 2019 DESOTO
Description:

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

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	1629	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	569	vph
Length of first accel/decel lane	1200	ft
Length of second accel/decel lane		ft

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

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

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

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1629	569		vph
Peak-hour factor, PHF	0.90	0.90		
Peak 15-min volume, v15	453	158		v
Trucks and buses	6	6		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	%
Length	mi	mi	mi	mi
Trucks and buses PCE, ET	1.5*	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.971	0.971	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	1864	651	pcph

----- Estimation of V12 Merge Areas -----

L = (Equation 25-2 or 25-3)
 EQ
 P = 1.000 Using Equation 0
 FM
 $v_{12} = v_F (P_{FM}) = 1864 \text{ pc/h}$

----- Capacity Checks -----

	Actual	Maximum	LOS F?
v	2515	4800	No
FO			
v	0 pc/h	(Equation 25-4 or 25-5)	
3 or av34			
Is v > 2700 pc/h?		No	
3 or av34			
Is v > 1.5 v / 2		No	
3 or av34	12		
If yes, v =		(Equation 25-8)	
12A			

----- Flow Entering Merge Influence Area -----

	Actual	Max Desirable	Violation?
v	1864	4400	No
12			!

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

Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 17.3 \text{ pc/mi/ln}$
 Level of service for ramp-freeway junction areas of influence B

----- Speed Estimation -----

Intermediate speed variable,	M = 0.285	
	S	
Space mean speed in ramp influence area,	S = 62.0	mph
	R	
Space mean speed in outer lanes,	S = N/A	mph
	0	
Space mean speed for all vehicles,	S = 62.0	mph

Phone: Fax:
E-mail:

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

Analyst: GSR
Agency/Co.: AIM ENGINEERING
Date performed: 4/4/2012
Analysis time period: AM
Freeway/Dir of Travel: I-75 EB
Junction: SR 951 OFF RAMP
Jurisdiction:
Analysis Year: 2019 EVERGLADES
Description:

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

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2761	vph

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

Side of freeway	Right	
Number of lanes in ramp	2	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	1462	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane	0	ft

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

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

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

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2761	1462		vph
Peak-hour factor, PHF	0.90	0.90		
Peak 15-min volume, v15	767	406		v
Trucks and buses	6	6		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5*	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.971	0.971	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3160	1673	pcph

----- Estimation of V12 Diverge Areas -----

L = (Equation 25-8 or 25-9)
 EQ
 P = 1.000 Using Equation 0
 FD
 $v_{12} = v_R + (v_F - v_R) P = 3160$ pc/h
 FD

----- Capacity Checks -----

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3160	4800	No
$v_{FO} = v_F - v_R$	1487	4800	No
v_R	1673	4100	No
$v_{3 \text{ or } 34}$	0 pc/h	(Equation 25-15 or 25-16)	
Is $v_{3 \text{ or } 34} > 2700$ pc/h?		No	
Is $v_{3 \text{ or } 34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} =$		(Equation 25-18)	

----- Flow Entering Diverge Influence Area -----

	Actual	Max Desirable	Violation?
v_{12}	3160	4600	No

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

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 22.4$ pc/mi/ln
 Level of service for ramp-freeway junction areas of influence C

----- Speed Estimation -----

Intermediate speed variable,	D = 0.449	
Space mean speed in ramp influence area,	S = 57.4	mph
Space mean speed in outer lanes,	S = N/A	mph
Space mean speed for all vehicles,	S = 57.4	mph

RAMPS AND RAMP JUNCTIONS WORKSHEET											
General Information					Site Information						
Analyst	AL				Freeway/Dir of Travel	I-75 EB					
Agency or Company	AIM ENGINEERING				Junction	SR 951 EB ON					
Date Performed	3/16/2012				Jurisdiction						
Analysis Time Period	AM				Analysis Year	2019- EVERGLADES DESOTO					
Project Description											
Inputs											
Upstream Adj Ramp		Number of Lanes, N			2 ✓			Downstream Adj Ramp			
<input type="checkbox"/> Yes <input type="checkbox"/> On		Acceleration Lane Length, L _A			465			<input type="checkbox"/> Yes <input type="checkbox"/> On			
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off		Deceleration Lane Length L _D						<input checked="" type="checkbox"/> No <input type="checkbox"/> Off			
L _{up} =	ft		Freeway Volume, V _F			1299 ✓			L _{down} =	ft	
V _u =	veh/h		Ramp Volume, V _R			428 ✓			V _D =	veh/h	
			Freeway Free-Flow Speed, S _{FF}			70.0 ✓					
			Ramp Free-Flow Speed, S _{FR}			35.0					
Conversion to pc/h Under Base Conditions											
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p			
Freeway	1299	0.90 ✓	Level	6	0	0.971	1.00 ✓	1487			
Ramp	428	0.90 ✓	Level	6	0	0.971	1.00 ✓	490			
UpStream											
DownStream											
Merge Areas					Diverge Areas						
Estimation of v₁₂					Estimation of v₁₂						
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 1.000 using Equation (Exhibit 13-6) V ₁₂ = 1487 pc/h V ₃ or V _{av34} = 0 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = using Equation (Exhibit 13-7) V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)						
Capacity Checks					Capacity Checks						
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?		
V _{FO}	1977	Exhibit 13-8		No	V _F		Exhibit 13-8				
					V _{FO} = V _F - V _R		Exhibit 13-8				
					V _R		Exhibit 13-10				
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area						
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?		
V _{R12}	1977	Exhibit 13-8		No	V ₁₂		Exhibit 13-8				
Level of Service Determination (if not F)					Level of Service Determination (if not F)						
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 17.8 (pc/mi/ln) LOS = B (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)						

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	AL				Freeway/Dir of Travel	I-75 WB			
Agency or Company	AIM ENGINEERING				Junction	SR 951 OFF RAMP			
Date Performed	3/8/2012				Jurisdiction				
Analysis Time Period	AM				Analysis Year	2019-EVERGLADES <i>DESOTO</i>			
Project Description									
Inputs									
Upstream Adj Ramp		Number of Lanes, N			2 ✓			Downstream Adj Ramp	
<input type="checkbox"/> Yes <input type="checkbox"/> On		Acceleration Lane Length, L _A						<input type="checkbox"/> Yes <input type="checkbox"/> On	
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off		Deceleration Lane Length L _D			220			<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	
L _{up} = ft		Freeway Volume, V _F			2198 ✓			L _{down} = ft	
V _u = veh/h		Ramp Volume, V _R			545 ✓			V _D = veh/h	
		Freeway Free-Flow Speed, S _{FF}			70.0 ✓				
		Ramp Free-Flow Speed, S _{FR}			45.0 ✓				
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	2198	0.90 ✓	Level	6	0	0.971	1.00 ✓	2515	
Ramp	545	0.90 ✓	Level	6	0	0.971	1.00 ✓	624	
UpStream									
DownStream									
Merge Areas					Diverge Areas				
Estimation of v₁₂					Estimation of v₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) P _{FD} = 1.000 using Equation (Exhibit 13-7) V ₁₂ = 2515 pc/h V ₃ or V _{av34} 0 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	2515	Exhibit 13-8	4800	No
					V _{FO} = V _F - V _R	1891	Exhibit 13-8	4800	No
					V _R	624	Exhibit 13-10	2100	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}		Exhibit 13-8			V ₁₂	2515	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = 23.9 (pc/mi/ln) LOS = C (Exhibit 13-2)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	AL				Freeway/Dir of Travel	I-75 WB			
Agency or Company	AIM ENGINEERING				Junction	SR 951 WB ON			
Date Performed	3/16/2012				Jurisdiction				
Analysis Time Period	AM				Analysis Year	2019 EVERGLADES DESOTO			
Project Description									
Inputs									
Upstream Adj Ramp		Number of Lanes, N			2 ✓			Downstream Adj Ramp	
<input type="checkbox"/> Yes <input type="checkbox"/> On		Acceleration Lane Length, L _A			385			<input type="checkbox"/> Yes <input type="checkbox"/> On	
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off		Deceleration Lane Length L _D						<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	
L _{up} = ft		Freeway Volume, V _F			1653 ✓			L _{down} = ft	
V _u = veh/h		Ramp Volume, V _R			1860 ✓			V _D = veh/h	
		Freeway Free-Flow Speed, S _{FF}			70.0 ✓				
		Ramp Free-Flow Speed, S _{FR}			35.0				
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	1653	0.90 ✓	Level	6	0	0.971	1.00 ✓	1892	
Ramp	1860	0.90 ✓	Level	6	0	0.971	1.00 ✓	2129	
UpStream									
DownStream									
Merge Areas					Diverge Areas				
Estimation of v₁₂					Estimation of v₁₂				
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L _{EQ} = P _{FM} = 1.000 using Equation (Exhibit 13-6) V ₁₂ = 1892 pc/h V ₃ or V _{av34} = 0 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L _{EQ} = P _{FD} = using Equation (Exhibit 13-7) V ₁₂ = pc/h V ₃ or V _{av34} = pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}	4021	Exhibit 13-8		No	V _F		Exhibit 13-8		
					V _{FO} = V _F - V _R		Exhibit 13-8		
					V _R		Exhibit 13-10		
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}	4021	Exhibit 13-8 4600:All		No	V ₁₂		Exhibit 13-8		
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = 33.4 (pc/mi/ln) LOS = D (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst	AL				Freeway/Dir of Travel	I-75 NB			
Agency or Company	AIM ENGINEERING				Junction	GGP NB OFF RAMP			
Date Performed	3/8/2012				Jurisdiction				
Analysis Time Period	AM				Analysis Year	2019 EVERGLADES <i>DESOTO</i>			
Project Description									
Inputs									
Upstream Adj Ramp		Number of Lanes, N			3 ✓			Downstream Adj Ramp	
<input type="checkbox"/> Yes	<input type="checkbox"/> On	Acceleration Lane Length, L _A						<input type="checkbox"/> Yes <input type="checkbox"/> On	
<input checked="" type="checkbox"/> No	<input type="checkbox"/> Off	Deceleration Lane Length L _D			310			<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	
L _{up} =	ft	Freeway Volume, V _F			3513 ✓			L _{down} =	
V _u =	veh/h	Ramp Volume, V _R			529 ✓			ft	
		Freeway Free-Flow Speed, S _{FF}			70.0 ✓			V _D =	
		Ramp Free-Flow Speed, S _{FR}			45.0 ✓			veh/h	
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p	
Freeway	3513	0.90 ✓	Level	6	0	0.971	1.00 ✓	4020	
Ramp	529	0.90 ✓	Level	6	0	0.971	1.00 ✓	605	
UpStream									
DownStream									
Merge Areas					Diverge Areas				
Estimation of v₁₂					Estimation of v₁₂				
$V_{12} = V_F (P_{FM})$ L _{EQ} = (Equation 13-6 or 13-7) P _{FM} = using Equation (Exhibit 13-6) V ₁₂ = pc/h V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)					$V_{12} = V_R + (V_F - V_R)P_{FD}$ L _{EQ} = (Equation 13-12 or 13-13) P _{FD} = 0.632 using Equation (Exhibit 13-7) V ₁₂ = 2762 pc/h V ₃ or V _{av34} 1258 pc/h (Equation 13-14 or 13-17) Is V ₃ or V _{av34} > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V ₃ or V _{av34} > 1.5 * V ₁₂ /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V _{12a} = pc/h (Equation 13-16, 13-18, or 13-19)				
Capacity Checks					Capacity Checks				
	Actual	Capacity		LOS F?		Actual	Capacity		LOS F?
V _{FO}		Exhibit 13-8			V _F	4020	Exhibit 13-8	7200	No
					V _{FO} = V _F - V _R	3415	Exhibit 13-8	7200	No
					V _R	605	Exhibit 13-10	2100	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area				
	Actual	Max Desirable		Violation?		Actual	Max Desirable		Violation?
V _{R12}		Exhibit 13-8			V ₁₂	2762	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D _R = (pc/mi/ln) LOS = (Exhibit 13-2)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D _R = 25.2 (pc/mi/ln) LOS = C (Exhibit 13-2)				