

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		JRE		Freeway/Dir of Travel		I-80 Eastbound			
Agency or Company		AECOM		Junction		Int. 303 to Route 611			
Date Performed		9/11/2014		Jurisdiction					
Analysis Time Period		A.M. Peak Hour		Analysis Year		Alt D1 Ph II 2045			
Project Description Interstate 80 Reconstruction									
Inputs									
Upstream Adj Ramp		Number of Lanes, N				Downstream Adj Ramp			
<input type="checkbox"/> Yes <input type="checkbox"/> On		Acceleration Lane Length, L_A				<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On			
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off		Deceleration Lane Length L_D				<input type="checkbox"/> No <input type="checkbox"/> Off			
$L_{up} =$ ft		Freeway Volume, V_F				$L_{down} =$ 1500 ft			
$V_u =$ veh/h		Ramp Volume, V_R				$V_D =$ 170 veh/h			
		Freeway Free-Flow Speed, S_{FF}							
		Ramp Free-Flow Speed, S_{FR}							
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	2689	0.94	Rolling	10	1	0.862	0.95	3493	
Ramp	243	0.72	Rolling	1	0	0.985	0.95	361	
UpStream									
DownStream	170	0.72	Rolling	1	0	0.985	0.95	252	
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$					$V_{12} = V_R + (V_F - V_R)P_{FD}$				
(Equation 13-6 or 13-7)					(Equation 13-12 or 13-13)				
$L_{EQ} =$					$L_{EQ} =$				
using Equation (Exhibit 13-6)					0.656 using Equation (Exhibit 13-7)				
$P_{FM} =$					$P_{FD} =$				
$V_{12} =$ pc/h					$V_{12} =$ 2416 pc/h				
V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)					V_3 or V_{av34} 1077 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 $V_{av34} > 2,700$ 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 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)					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	3493	Exhibit 13-8	7200	No
			$V_{FO} = V_F - V_R$	3132	Exhibit 13-8	7200	No		
			V_R	361	Exhibit 13-10	2000	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}	2416	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$				
$D_R =$ (pc/mi/ln)					$D_R =$ 18.3 (pc/mi/ln)				
LOS = (Exhibit 13-2)					LOS = B (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ (Exhibit 13-11)					$D_s =$ 0.460 (Exhibit 13-12)				
$S_R =$ mph (Exhibit 13-11)					$S_R =$ 57.1 mph (Exhibit 13-12)				
$S_0 =$ mph (Exhibit 13-11)					$S_0 =$ 76.5 mph (Exhibit 13-12)				
$S =$ mph (Exhibit 13-13)					$S =$ 61.9 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		JRE		Freeway/Dir of Travel		I-80 Eastbound			
Agency or Company		AECOM		Junction		Int. 303 to Route 611			
Date Performed		9/11/2014		Jurisdiction					
Analysis Time Period		P.M. Peak Hour		Analysis Year		Alt D1 Ph II 2045			
Project Description Interstate 80 Reconstruction									
Inputs									
Upstream Adj Ramp		Number of Lanes, N				Downstream Adj Ramp			
<input type="checkbox"/> Yes <input type="checkbox"/> On		Acceleration Lane Length, L_A				<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On			
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off		Deceleration Lane Length L_D				<input type="checkbox"/> No <input type="checkbox"/> Off			
$L_{up} =$ ft		Freeway Volume, V_F				$L_{down} =$ 1500 ft			
$V_u =$ veh/h		Ramp Volume, V_R				$V_D =$ 239 veh/h			
		Freeway Free-Flow Speed, S_{FF}							
		Ramp Free-Flow Speed, S_{FR}							
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	3390	0.94	Rolling	12	1	0.840	0.95	4517	
Ramp	324	0.97	Rolling	1	0	0.985	0.95	357	
UpStream									
DownStream	239	0.97	Rolling	1	0	0.985	0.95	263	
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$					$V_{12} = V_R + (V_F - V_R)P_{FD}$				
(Equation 13-6 or 13-7)					(Equation 13-12 or 13-13)				
$L_{EQ} =$					$L_{EQ} =$				
$P_{FM} =$ using Equation (Exhibit 13-6)					$P_{FD} =$ 0.631 using Equation (Exhibit 13-7)				
$V_{12} =$ pc/h					$V_{12} =$ 2981 pc/h				
V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)					V_3 or V_{av34} 1536 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 $V_{av34} > 2,700$ 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 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)					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	4517	Exhibit 13-8	7200	No
			$V_{FO} = V_F - V_R$	4160	Exhibit 13-8	7200	No		
			V_R	357	Exhibit 13-10	2000	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}	2981	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$				
$D_R =$ (pc/mi/ln)					$D_R =$ 23.1 (pc/mi/ln)				
LOS = (Exhibit 13-2)					LOS = C (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ (Exhibit 13-11)					$D_S =$ 0.460 (Exhibit 13-12)				
$S_R =$ mph (Exhibit 13-11)					$S_R =$ 57.1 mph (Exhibit 13-12)				
$S_0 =$ mph (Exhibit 13-11)					$S_0 =$ 74.7 mph (Exhibit 13-12)				
$S =$ mph (Exhibit 13-13)					$S =$ 62.1 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		JRE		Freeway/Dir of Travel		I-80 Westbound			
Agency or Company		AECOM		Junction		Int. 304 to Rt 209			
Date Performed		9/11/2014		Jurisdiction					
Analysis Time Period		A.M. Peak Hour		Analysis Year		Alt D1 Ph II 2045			
Project Description Interstate 80 Reconstruction									
Inputs									
Upstream Adj Ramp		Number of Lanes, N				Downstream Adj Ramp			
<input type="checkbox"/> Yes <input type="checkbox"/> On		Acceleration Lane Length, L_A				<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On			
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off		Deceleration Lane Length L_D				<input type="checkbox"/> No <input type="checkbox"/> Off			
$L_{up} =$ ft		Freeway Volume, V_F				$L_{down} =$ 3000 ft			
$V_u =$ veh/h		Ramp Volume, V_R				$V_D =$ 196 veh/h			
		Freeway Free-Flow Speed, S_{FF}							
		Ramp Free-Flow Speed, S_{FR}							
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	3206	0.93	Rolling	12	1	0.840	0.95	4318	
Ramp	1023	0.84	Rolling	1	0	0.985	0.95	1301	
UpStream									
DownStream	196	0.84	Rolling	1	0	0.985	0.95	249	
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$					$V_{12} = V_R + (V_F - V_R)P_{FD}$				
$L_{EQ} =$ (Equation 13-6 or 13-7)					$L_{EQ} =$ (Equation 13-12 or 13-13)				
$P_{FM} =$ using Equation (Exhibit 13-6)					$P_{FD} =$ 0.260 using Equation (Exhibit 13-7)				
$V_{12} =$ pc/h					$V_{12} =$ 2085 pc/h				
V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)					V_3 or V_{av34} 1116 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 $V_{av34} > 2,700$ 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 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)					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	4318	Exhibit 13-8	9600	No
				$V_{FO} = V_F - V_R$	3017	Exhibit 13-8	9600	No	
				V_R	1301	Exhibit 13-10	4000	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}	2085	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$				
$D_R =$ (pc/mi/ln)					$D_R =$ 4.2 (pc/mi/ln)				
LOS = (Exhibit 13-2)					LOS = A (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ (Exhibit 13-11)					$D_S =$ 0.545 (Exhibit 13-12)				
$S_R =$ mph (Exhibit 13-11)					$S_R =$ 54.7 mph (Exhibit 13-12)				
$S_0 =$ mph (Exhibit 13-11)					$S_0 =$ 76.3 mph (Exhibit 13-12)				
$S =$ mph (Exhibit 13-13)					$S =$ 64.1 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		JRE		Freeway/Dir of Travel		I-80 Westbound			
Agency or Company		AECOM		Junction		Int. 304 to Rt 209			
Date Performed		9/11/2014		Jurisdiction					
Analysis Time Period		P.M. Peak Hour		Analysis Year		Alt D1 Ph II 2045			
Project Description Interstate 80 Reconstruction									
Inputs									
Upstream Adj Ramp		Number of Lanes, N				Downstream Adj Ramp			
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> On		Acceleration Lane Length, L_A				<input type="checkbox"/> Yes <input type="checkbox"/> On			
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off		Deceleration Lane Length L_D				<input checked="" type="checkbox"/> No <input type="checkbox"/> Off			
$L_{up} = 3000$ ft		Freeway Volume, V_F				$L_{down} =$ ft			
$V_u = 377$ veh/h		Ramp Volume, V_R				$V_D =$ veh/h			
		Freeway Free-Flow Speed, S_{FF}							
		Ramp Free-Flow Speed, S_{FR}							
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	6672	0.96	Rolling	13	1	0.830	0.95	8816	
Ramp	2001	0.90	Rolling	1	0	0.985	0.95	2375	
UpStream	377	0.90	Rolling	1	0	0.985	0.95	448	
DownStream									
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$					$V_{12} = V_R + (V_F - V_R)P_{FD}$				
(Equation 13-6 or 13-7)					(Equation 13-12 or 13-13)				
$L_{EQ} =$					$L_{EQ} =$				
using Equation (Exhibit 13-6)					0.260 using Equation (Exhibit 13-7)				
$P_{FM} =$					$P_{FD} =$				
$V_{12} =$					$V_{12} =$				
pc/h					4050 pc/h				
V_3 or V_{av34}					V_3 or V_{av34}				
pc/h (Equation 13-14 or 13-17)					2383 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 $V_{av34} > 2,700$ 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 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, $V_{12a} =$					If Yes, $V_{12a} =$				
pc/h (Equation 13-16, 13-18, or 13-19)					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	8816	Exhibit 13-8	9600	No
			$V_{FO} = V_F - V_R$	6441	Exhibit 13-8	9600	No		
			V_R	2375	Exhibit 13-10	4000	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}	4050	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$				
$D_R =$ (pc/mi/ln)					$D_R =$ 21.1 (pc/mi/ln)				
LOS = (Exhibit 13-2)					LOS = C (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ (Exhibit 13-11)					$D_S =$ 0.642 (Exhibit 13-12)				
$S_R =$ mph (Exhibit 13-11)					$S_R =$ 52.0 mph (Exhibit 13-12)				
$S_0 =$ mph (Exhibit 13-11)					$S_0 =$ 71.4 mph (Exhibit 13-12)				
$S =$ mph (Exhibit 13-13)					$S =$ 61.0 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		JRE		Freeway/Dir of Travel		I-80 Westbound			
Agency or Company		AECOM		Junction		Int. 305 to Main St			
Date Performed		9/11/14		Jurisdiction					
Analysis Time Period		A.M. Peak Hour		Analysis Year		Alt D1 Ph II 2045			
Project Description Interstate 80 Reconstruction									
Inputs									
Upstream Adj Ramp		Number of Lanes, N				Downstream Adj Ramp			
<input type="checkbox"/> Yes <input type="checkbox"/> On		Acceleration Lane Length, L_A				<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On			
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off		Deceleration Lane Length L_D				<input type="checkbox"/> No <input type="checkbox"/> Off			
$L_{up} =$ ft		Freeway Volume, V_F				$L_{down} =$ 3000 ft			
$V_u =$ veh/h		Ramp Volume, V_R				$V_D =$ 196 veh/h			
		Freeway Free-Flow Speed, S_{FF}							
		Ramp Free-Flow Speed, S_{FR}							
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	3206	0.93	Rolling	12	1	0.840	0.95	4318	
Ramp	279	0.84	Rolling	1	0	0.985	0.95	355	
UpStream									
DownStream	196	0.84	Rolling	1	0	0.985	0.95	249	
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$					$V_{12} = V_R + (V_F - V_R)P_{FD}$				
$L_{EQ} =$ (Equation 13-6 or 13-7)					$L_{EQ} =$ (Equation 13-12 or 13-13)				
$P_{FM} =$ using Equation (Exhibit 13-6)					$P_{FD} =$ 0.436 using Equation (Exhibit 13-7)				
$V_{12} =$ pc/h					$V_{12} =$ 2083 pc/h				
V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)					V_3 or V_{av34} 1117 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 $V_{av34} > 2,700$ 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 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)					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	4318	Exhibit 13-8	9600	No
				$V_{FO} = V_F - V_R$	3963	Exhibit 13-8	9600	No	
				V_R	355	Exhibit 13-10	2000	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}	2083	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of Service Determination (if not F)				
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$				
$D_R =$ (pc/mi/ln)					$D_R =$ 15.4 (pc/mi/ln)				
LOS = (Exhibit 13-2)					LOS = B (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ (Exhibit 13-11)					$D_s =$ 0.460 (Exhibit 13-12)				
$S_R =$ mph (Exhibit 13-11)					$S_R =$ 57.1 mph (Exhibit 13-12)				
$S_0 =$ mph (Exhibit 13-11)					$S_0 =$ 76.3 mph (Exhibit 13-12)				
$S =$ mph (Exhibit 13-13)					$S =$ 65.7 mph (Exhibit 13-13)				

RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Information					Site Information				
Analyst		JRE		Freeway/Dir of Travel		I-80 Westbound			
Agency or Company		AECOM		Junction		Int. 305 to Main St			
Date Performed		9/11/2014		Jurisdiction					
Analysis Time Period		P.M. Peak Hour		Analysis Year		Alt D1 Ph II 2045			
Project Description Interstate 80 Reconstruction									
Inputs									
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off $L_{up} =$ ft $V_u =$ veh/h		Number of Lanes, N 4 Acceleration Lane Length, L_A Deceleration Lane Length L_D 750 Freeway Volume, V_F 6672 Ramp Volume, V_R 602 Freeway Free-Flow Speed, S_{FF} 70.0 Ramp Free-Flow Speed, S_{FR} 35.0				Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off $L_{down} =$ 3000 ft $V_D =$ 360 veh/h			
Conversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$	
Freeway	6672	0.96	Rolling	13	1	0.830	0.95	8816	
Ramp	602	0.90	Rolling	1	0	0.985	0.95	715	
UpStream									
DownStream	360	0.90	Rolling	1	0	0.985	0.95	427	
Merge Areas					Diverge Areas				
Estimation of v_{12}					Estimation of v_{12}				
$V_{12} = V_F (P_{FM})$ $L_{EQ} =$ (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) $P_{FD} =$ 0.436 using Equation (Exhibit 13-7) $V_{12} =$ 4247 pc/h V_3 or V_{av34} 2284 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	8816	Exhibit 13-8	9600	No
				$V_{FO} = V_F - V_R$	8101	Exhibit 13-8	9600	No	
				V_R	715	Exhibit 13-10	2000	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}	4247	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)					$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ 34.0 (pc/mi/ln) LOS = D (Exhibit 13-2)				
Speed Determination					Speed Determination				
$M_S =$ (Exhibit 13-11) $S_R =$ mph (Exhibit 13-11) $S_0 =$ mph (Exhibit 13-11) $S =$ mph (Exhibit 13-13)					$D_s =$ 0.492 (Exhibit 13-12) $S_R =$ 56.2 mph (Exhibit 13-12) $S_0 =$ 71.8 mph (Exhibit 13-12) $S =$ 63.3 mph (Exhibit 13-13)				