			REEWAY	<u> WEAVI</u>	NG WOR	RKSHEE	<u>T</u>		
General	Informati	on			Site Info	rmation			
Analyst Agency/Con Date Perforr Analysis Tin	ned	AECO AM	М		Freeway/Dir of Travel I-95 NB Weaving Segment Location Seg 1-Bet Copans & Sample Analysis Year No-Build 2020				
Project Desc	cription SW 10t	h Street SIMF	₹						
Inputs					•				
Weaving seg	mber of lanes, N gment length, L _e e-flow speed, Fl	S FS		1820ft 70 mph	Segment typo Freeway min Freeway max Terrain type	imum speed			Freeway 15 2400 Leve
Convers	sions to po	1		1			Ι,	1 ,	((1)
.,	V (veh/h)	PHF	Truck (%)	RV (%)	E _T	E _R	f _{HV}	fp	v (pc/h)
V _{FF}	4435	0.95	3	0	1.5	1.2	0.985	1.00	4738
V _{RF}	345	0.92	2	0	1.5	1.2	0.990	1.00	379
V _{FR}	810	0.92	2	0	1.5	1.2	0.990	1.00	889
V_{RR}	0	0.92	0	0	1.5	1.2	1.000	1.00	0
V _{NW}	4738							V =	6006
V _W	1268								
VR	0.211								
Configu	ration Cha	aracteris	tics		1				
Minimum m	aneuver lanes,	N_WL		2 lc		-	hanges, LC _{MIN}	ı	1268 lc/h
Interchange				0.7 int/mi	Weaving lan	e changes, L	$_{C_{W}}$		1640 lc/h
Minimum R	F lane changes,	LC_{RF}		1 lc/pc	Non-weaving	g lane chang	es, LC _{NW}		1192 lc/h
Minimum FF	R lane changes,	LC_{FR}		1 lc/pc	Total lane ch	nanges, LC _{AL}	L		2832 lc/h
Minimum R	R lane changes	, LC _{RR}		lc/pc	Non-weaving	g vehicle inde	ex, I _{NW}		604
Weavin	g Segmen	t Speed,	Density, I	_evel of	Service,	and Cap	oacity		
Weaving se	gment flow rate	, V		5924 veh/h	Weaving inte	•			0.320
Weaving se	gment capacity,	, C _W		8603 veh/h					54.3 mph
Ū	gment v/c ratio			0.689					56.7 mph
•	gment density,	D	2	7.7 pc/mi/ln					53.7 mph
I AVAL OF SAI	vice, LOS			С	Maximum weaving length, L _{MAX} 4650 f				

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

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	BASIC F	REEWAY SE	GMENTS WORKSHEET			
General Information			Site Information			
Analyst			Highway/Direction of Travel	I-95 NB		
Agency or Company	AECOM		From/To	Seg 2-B	Bet Off & On from	
Date Performed			Jurisdiction	Sample		
Analysis Time Period	AM		Analysis Year	No-Buila	2020	
Project Description SW 10th	Street SIMR					
✓ Oper.(LOS)			Des.(N)	□Pla	nning Data	
Flow Inputs						
Volume, V	4780	veh/h	Peak-Hour Factor, PHF	0.95		
AADT		veh/day	%Trucks and Buses, P _T	3		
Peak-Hr Prop. of AADT, K			%RVs, P _R	0		
Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	General Terrain: Grade % Length	Level mi		
JUIN - MULKIKA D		VCIIIII	Up/Down %	1111		
Calculate Flow Adjustn	nents		· · · · · · · · · · · · · · · · · · ·			
f _p	1.00		E _R	1.2		
E _T	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985		
	1.0					
Speed Inputs			Calc Speed Adj and FFS	<u> </u>		
Lane Width		ft				
Rt-Side Lat. Clearance		ft	f _{LW}		mph	
Number of Lanes, N	3		f _{LC}		mph	
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph	
FFS (measured)	70.0	mph	FFS	70.0	mph	
Base free-flow Speed, BFFS		mph				
LOS and Performance	Measures		Design (N)			
			Design (N)			
Operational (LOS)			Design LOS			
v _p = (V or DDHV) / (PHF x N x	(f _{HV} x f _p) 1702	pc/h/ln	$v_p = (V \text{ or DDHV}) / (PHF \times N \times N)$	fun x f)	pc/h/ln	
S	67.1	mph	S	нү р/	mph	
$D = v_p / S$	25.4	pc/mi/ln	D = v _p / S		pc/mi/ln	
LOS	С		Required Number of Lanes, N		ролили	
Glossary			Factor Location			
	0 0 :		i actor Location			
N - Number of lanes	S - Speed		E _R - Exhibits 11-10, 11-12		f _{I W} - Exhibit 11-8	
V - Hourly volume	D - Density	, anaad	E _T - Exhibits 11-10, 11-11, 11-	-13	f _{LC} - Exhibit 11-9	
v _p - Flow rate	FFS - Free-flow	-	f _n - Page 11-18		TRD - Page 11-11	
LOS - Level of service	BFFS - Base from	ee-flow speed	LOS, S, FFS, v _p - Exhibits 11-	2, 11-3	2	
DDHV - Directional design ho	ur volume					

	F	RAMPS AND	RAMP JUN	CTIONS W	/ORKSHI	EET													
General In				Site Infor															
Analyst			Fr	eeway/Dir of Tr		I-95 N	IB												
Agency or Comp	oanv A	AECOM		inction				rom Sample											
Date Performed				Jurisdiction															
Analysis Time P	eriod /	AM	Ar	nalysis Year		No-Bu	uild 2020												
Project Descripti	ion SW 10th S	Street SIMR																	
Inputs																			
Upstream Adj Ra	amn	Freeway Nur	nber of Lanes, N	3					Downstre	am Adi									
opolioum / laj / l	ap	Ramp Numb	er of Lanes, N	1					Ramp	, ann , taj									
Yes	On	Acceleration	Lane Length, L _A	500						- O-									
	7	I	Lane Length L _D						✓ Yes	☑ On									
✓ No	Off	Freeway Vol	- 5	4780					☐ No	Off									
L _{un} = ft	t		•						L _{down} =	1950 ft									
L _{up} = ft		Ramp Volum	13	1250					down										
V _u = ve	eh/h		e-Flow Speed, S _{FF}	70.0					V _D =	890 veh/h									
			low Speed, S _{FR}	50.0															
Conversio	n to pc/h	Inder Base	Conditions																
(pc/h)	(\/ab/b	, PHF	Terrain	%Truck	%Rv		f_{HV}	f_p	v = V/PH	F x f _{HV} x f _p									
Freeway	" / (ven/nr)				0	+,).985	1.00		5107									
Ramp	1250	0.95	Level	2	0	_	0.985	1.00		1372									
UpStream	1230	0.92	Level		0	+	7.990	1.00		1372									
DownStream	890	0.92	Level	2	0	1).990	1.00		977									
DOMINIO EL COLITI	000	Merge Areas	20101					Diverge Areas		011									
Estimation		Estimat	ion (of V ₁₂	- 3														
		= V _F (P _{FM})																	
	.=		- 10 7)				$V_{12} = $	$V_R + (V_F - V_F)$	R)P _{FD}										
L _{EQ} =	•	Equation 13-6 c	-		L _{EQ} =		(Equation 13	-12 or 13-	13)									
P _{FM} =			tion (Exhibit 13-6)		P _{FD} =		ι	using Equation	on (Exhibit 1	3-7)									
V ₁₂ =		11 pc/h			V ₁₂ =		ı	oc/h											
V_3 or V_{av34}	208 17		ion 13-14 or 13-		${ m V_3}$ or ${ m V_{av34}}$			pc/h (Equation	13-14 or 13-	17)									
Is V ₃ or V _{av34} >		*			Is V_3 or $V_{av34} > 2,700$ pc/h? \square Yes \square No														
Is V_3 or V_{av34} >					Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ Yes No														
		rres ⊡i∖o !1 pc/h (Equat	ion 13-16 13-		If Yes,V _{12a} =		12 -	oc/h (Equatio	n 13-16, 1	3-18, or									
f Yes,V _{12a} =		or 13-19)	1011 10-10, 10-		11 163, v _{12a} –		13	3-19)											
Capacity C		,			Capacity Checks														
	Actua	I	Capacity	LOS F?			Actual	Ca	pacity	LOS F?									
					V _F			Exhibit 13-	-8										
V	6479	Exhibit 13-8		No	V _{FO} = V _F	- V _D		Exhibit 13-	-8										
V_{FO}	0473	EXHIBIT 13-0		INO		K		Exhibit 13											
					V_R			10											
Flow Enter	ring Merge	Influence A	Area		Flow En	terii	ng Dive	rge Influer	nce Area	1									
	Actua	Max	Desirable	Violation?			Actual	Max Des	sirable	Violation?									
V_{R12}	4393	Exhibit 13-8	4600:All	No	V ₁₂			Exhibit 13-8	<u>L</u>										
	ervice Det	ermination		Level of	Ser	vice De	terminatio	n (if not	t F)										
D _R = 5.4	75 + 0.00734 v	_R + 0.0078 V ₁₂ - 0			D _R =	4.252 + 0	.0086 V ₁₂ - 0	0.009 L _D											
• • •	pc/mi/ln)		^		$D_R = (pc/mi/ln)$														
ii,	hibit 13-2)				LOS = (Exhibit 13-2)														
Speed Det		<u> </u>			· · · · · · · · · · · · · · · · · · ·														
		1			Speed Determination														
ŭ	(Exibit 13-11)				$D_s = \text{(Exhibit 13-12)}$														
S _R = 53.6 n	nph (Exhibit 13-	11)			S _R = mph (Exhibit 13-12)														
•	mph (Exhibit 13-	11)		S ₀ = mph (Exhibit 13-12)															
S = 56.6 n	nph (Exhibit 13-	13)			S = mph (Exhibit 13-13)														
ht @ 2016 Linius	roity of Florido Al	. D: 11 D				. —													

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	BASIC	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst			Highway/Direction of Travel	I-95 NB	
Agency or Company	AECOM		From/To		et On from Sample &
Date Performed			Jurisdiction	Ехр	
Analysis Time Period	AM		Analysis Year	No-Build	1 2020
Project Description SW 10th	Street SIMR				
✓ Oper.(LOS)			Des.(N)	☐ Pla	nning Data
Flow Inputs					
Volume, V	6030	veh/h	Peak-Hour Factor, PHF	0.95	
AADT		veh/day	%Trucks and Buses, P _T	3	
Peak-Hr Prop. of AADT, K			%RVs, P _R	0	
Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	General Terrain: Grade % Length	Level mi	
		VCII/II	Up/Down %	1111	
Calculate Flow Adjustm	nents		· · · · · · · · · · · · · · · · · · ·		
f _p	1.00		E _R	1.2	
E _T	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
	7.0		***		
Speed Inputs			Calc Speed Adj and FFS	<u> </u>	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f _{LW}		mph
Number of Lanes, N	3		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			
LOS and Performance	Measures		Design (N)		
			Design (N)		
Operational (LOS)			Design LOS		
v _p = (V or DDHV) / (PHF x N x	(f _{HV} x f _p) 2148	pc/h/ln	$v_p = (V \text{ or DDHV}) / (PHF x N x)$	$(f_{uv}, x f_{uv})$	pc/h/ln
S	59.6	mph	S	HV p ⁷	mph
$D = v_p / S$	36.1	pc/mi/ln	D = v _p / S		pc/mi/ln
LOS	E		Required Number of Lanes, N		p 6,
Glossary			Factor Location		
	0 0 1		l actor Location		
N - Number of lanes	S - Speed		E _R - Exhibits 11-10, 11-12		f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	, anaad	E _T - Exhibits 11-10, 11-11, 11-	-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow	-	f _n - Page 11-18		TRD - Page 11-11
LOS - Level of service	BFFS - Base fr	ee-flow speed	LOS, S, FFS, v _p - Exhibits 11-	2, 11-3	-
DDHV - Directional design ho	ur volume		<u> </u>		

		RA	MPS AND	RAMP JUN	CTIONS W	ORKSH	EET				
Genera	l Infor				Site Infor						
Analyst				Fr	reeway/Dir of Tr		I-95 N	JB			
Agency or C	Company	AEC	OM		unction			5-On from Ex	(D		
Date Perfor				Ju	urisdiction		5		r		
Analysis Tir	me Period	l AM		Aı	nalysis Year		No-Bu	uild 2020			
Project Des	cription	SW 10th Stree	et SIMR								
Inputs			_							_	
Upstream A	di Ramp		Freeway Nun	ber of Lanes, N	3					Downstre	eam Adi
			Ramp Numbe	er of Lanes, N	1					Ramp	
☐ Yes	On	1	Acceleration I	_ane Length, L _Δ	600					✓ Yes	☐ On
d NI a		•	1	Lane Length L _D							
✓ No	Off	Í	Freeway Volu		6030					☐ No	✓ Off
L _{up} =	ft		Ramp Volume		890					L _{down} =	5545 ft
up	.,		1	11							
V _u =	veh/h		1	e-Flow Speed, S _{FF}	70.0					$V_D =$	1070 veh/h
				low Speed, S _{FR}	50.0						
Conver	sion to	o pc/h Un	der Base	Conditions		1				_	
(pc/	h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv		f_{HV}	f _p	v = V/PH	F x f _{HV} x f _p
Freeway		6030	0.95	Level	3	0		0.985	1.00		6443
Ramp		890	0.92	Level	2	0	_	0.990	1.00	+	977
UpStream		030	0.02	Level	-		+	3.330	1.00		311
DownStrea	ım	1070	0.92	Level	2	0	(0.990	1.00		1175
			Merge Areas						Diverge Areas		-
Estimation of v ₁₂						Estimat	ion	of v ₁₂			
		V ₁₂ = V _F	(P)								
. =			• •••	13-6 or 13-7)					V _R + (V _F - V		
L _{EQ} = P =				•	\	L _{EQ} =			(Equation 13		•
P _{FM} =				tion (Exhibit 13-6))	P _{FD} =		ı	using Equati	ion (Exhibit 1	13-7)
V ₁₂ =		3894	•	on 10 11 or 10		V ₁₂ =		1	pc/h		
V ₃ or V _{av34}		2549 17)	pc/n (Equali	on 13-14 or 13-	•	$\mathrm{V_3}$ or $\mathrm{V_{av34}}$			pc/h (Equation	13-14 or 13-	17)
Is V ₂ or V ₂	> 2,70	0 pc/h?	s V No			Is V_3 or $V_{av34} > 2,700$ pc/h? \square Yes \square No					
		'V ₁₂ /2				Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ Yes \square No					
				on 13-16, 13-		lf Yes V = pc/h (Equation 13-16, 13-18, or					
If Yes,V _{12a} :	=		13-19)	011 10 10, 10		11 100, v _{12a}		1;	3-19)		
Capacit	ty Che					Capacity Checks					
		Actual	(Capacity	LOS F?			Actual	C	apacity	LOS F?
						V_{F}			Exhibit 13	3-8	
V _F	_	7420	Exhibit 13-8		Yes	$V_{FO} = V_{F}$	- V _D		Exhibit 13	3-8	
V F	0	1420	LATIIDIL 13-0		163				Exhibit 1		
						V _R			10		
Flow Er	ntering	g Merge In	fluence A	\rea		Flow En	<u>iteri</u>	ng Dive	rge Influe	nce Area	1
		Actual	Max	Desirable	Violation?			Actual	Max De	sirable	Violation?
V_{R1}	12	5338	Exhibit 13-8	4600:All	Yes	V ₁₂			Exhibit 13-8		
Level o		Level of	f Sei	rvice De	terminati	on (if no	t 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 = 4	2.9 (pc/m	i/ln)				$D_R = (pc/mi/ln)$					
l '`	Exhibit							•			
	•	nination				· · · · · · · · · · · · · · · · · · ·					
						Speed Determination					
~	.073 (Exil	,				D _s = (Exhibit 13-12)					
'`	-	(Exhibit 13-11)				S _R = mph (Exhibit 13-12)					
ľ		(Exhibit 13-11)				ľ	. ,	khibit 13-12)			
S = 4	4.7 mph ((Exhibit 13-13)				S = m	ph (Ex	khibit 13-13)			
	- 44.7 Hight (Exhibit 10-10)										

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BASIC F	REEWAY SE	GMENTS WORKSHEET		
		Site Information		
AECOM		Highway/Direction of Travel From/To Jurisdiction	I-95 NB	
AM		Analysis Year	No-Buila	2020
Street SIMR				
		Des.(N)	□Pla	nning Data
6920	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R	0.95 3 0	
	veh/h	General Terrain: Grade % Length Up/Down %	Level mi	
nents				
1.00		E _R	1.2	
1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
		Calc Speed Adj and FFS	6	
	ft			
	ft	f_{LW}		mph
3		f_{LC}		mph
	ramps/mi	TRD Adjustment		mph
70.0	mph	FFS	70.0	mph
	mph			
Measures		Design (N)		
(f, x f) 2464	pc/h/ln	<u>Design (N)</u> Design LOS		
р	•	$V_p = (V \text{ or DDHV}) / (PHF x N x)$	$f_{HV} \times f_p$)	pc/h/ln
47.9	•	S		mph
F	,			pc/mi/ln
		·		
S Spood				
•		E _R - Exhibits 11-10, 11-12		f _{LW} - Exhibit 11-8
•	sneed	E _T - Exhibits 11-10, 11-11, 11-	13	f _{LC} - Exhibit 11-9
	-	f _p - Page 11-18		TRD - Page 11-1
ur volume	se-now speed	LOS, S, FFS, v _p - Exhibits 11-	2, 11-3	
	AECOM AM Street SIMR 6920 6920 1.5 1.00 1.5 3 70.0 Measures (f _{HV} x f _p) 2464 51.5 47.9 F S - Speed D - Density FFS - Free-flow BFFS - Base free	AECOM AM Street SIMR 6920 veh/h veh/day veh/h 1.5 ft ft ft 3 ramps/mi 70.0 mph mph Measures (f _{HV} × f _p) 2464 pc/h/ln 51.5 mph 47.9 pc/mi/ln F S - Speed D - Density FFS - Free-flow speed BFFS - Base free-flow speed	AECOM AM AM Analysis Year Des.(N) Peak-Hour Factor, PHF veh/day New York PR General Terrain: Grade % Length Up/Down % Design (N) Calc Speed Adj and FFS ft	Site Information Highway/Direction of Travel From/To Jurisdiction AM Analysis Year No-Build N

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		RAMP	S AND RAM	P JUNCTI	ONS WO	RKS	HEET				
General Info	rmation			Site Infor	mation						
Analyst			Fr	eeway/Dir of Tr	avel	I-95 NE	3				
Agency or Compar	ny AEC	OM		ınction		Seg 7-0	Off Ramp to	o 10th St			
Date Performed	- d			ırisdiction		N. D. I	1 0000				
Analysis Time Peri Project Description		+ CIMD	Ar	nalysis Year		No-Buil	d 2020				
Inputs	300 10011 30100	EL SIIVIN									
•	D.	Freeway Num	ber of Lanes, N	3					Б	A 1'	
Upstream Adj	Kamp	Ramp Numbe		1					Downstre Ramp	am Adj	
□Yes	□On		ane Length, L _A	'					•		
			,,	250					✓ Yes	✓ On	
✓ No	Off	Freeway Volu	Lane Length L _D	250					□No	Off	
ı =	ft	6920					L _{down} =	1370 ft			
L _{up} =	it	Ramp Volume		1070					-down	1070 11	
V,, =	veh/h		-Flow Speed, S _{FF}	70.0					V _D =	1460 veh/h	
			low Speed, S _{FR}	45.0							
Conversion		<u>der Base</u>	Conditions	1	1		T				
(pc/h)	V (Veh/hr)	PHF	%Truck	%Rv		f_{HV}	f _p	v = V/PHF	$x f_{HV} x f_{p}$		
Freeway	6920	0.95	Level	3	0	0.	985	1.00	7:	393	
Ramp	1070	0.92	Level	2	0		990	1.00		175	
UpStream											
DownStream	1460	0.92	Level	2	0	0.	990	1.00	1	603	
		Merge Areas						iverge Areas			
Estimation of	of v ₁₂				Estimat	ion o	f v ₁₂				
	V ₁₂ = V _F	(P _{FM})					V ₁₂ =	V _R + (V _F - V _F	P _{FD}		
L _{EQ} =	(Equa	ation 13-6 or	13-7)		L _{EQ} =		(1	Equation 13-1	2 or 13-13	3)	
P _{FM} =	using	Equation (Exhibit 13-6)		P _{FD} =		0.	521 using Equ	uation (Exh	ibit 13-7)	
V ₁₂ =	pc/h				V ₁₂ =		44	15 pc/h			
V ₃ or V _{av34}	pc/h (Equation 13	-14 or 13-17)		V ₃ or V _{av34}		29	78 pc/h (Equa	ation 13-1	4 or 13-17)	
Is V ₃ or V _{av34} > 2,			,			₃₄ > 2,7		✓ Yes 🗌 No			
Is V ₃ or V _{av34} > 1.								Yes ☑ No			
If Yes,V _{12a} =			-16, 13-18, or		If Yes,V _{12a} =			93 pc/h (Equa	ation 13-1	6, 13-18,	
	13-19)					O	13-19)			
Capacity Ch					Capacit	y Ch					
	Actual		Capacity	LOS F?	ļ.,,		Actual		pacity	LOS F?	
					V _F		7393	Exhibit 13-8	-	Yes	
V_{FO}		Exhibit 13-8			$V_{FO} = V_{F}$	- V _R	6218	Exhibit 13-8	7200	No	
					V _R		1175	Exhibit 13-10	2100	No	
Flow Enterii	ng Merge Ir	fluence A	lrea 💮		Flow En	iterin	g Dive	rge Influen			
	Actual	1	Desirable	Violation?		-	Actual	Max Desirab		Violation?	
V _{R12}		Exhibit 13-8			V ₁₂		415	Exhibit 13-8	4400:All	Yes	
Level of Ser					+			terminatio	•	<i>F</i>)	
$D_R = 5.475 +$	* *	0.0078 V ₁₂	- 0.00627 L _A					.0086 V ₁₂ - 0.0	009 L _D		
D _R = (pc/mi/	ln)				$D_R = 42$	2.4 (pc/	/mi/ln)				
LOS = (Exhibi	t 13-2)				LOS = F (Exhibit 13-2)						
Speed Deter	rmination				Speed L	Deter	minatic	n			
M _S = (Exibit	13-11)				D _s = 0.404 (Exhibit 13-12)						
	khibit 13-11)				S _R = 58.7 mph (Exhibit 13-12)						
							S ₀ = 70.2 mph (Exhibit 13-12)				
	khibit 13-13)				S = 62.4 mph (Exhibit 13-13)						
• •	t © 2016 University of Florida. All Rights Reserved						0.6.90	•	Generated: F	/20/2019 12:1	

	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed	AECOM		Highway/Direction of Travel From/To Jurisdiction	I-95 NB Seg 8-B	et Off & On 10th St
Analysis Time Period	AM		Analysis Year	No-Build	1 2020
Project Description SW 10t					
✓ Oper.(LOS)			Des.(N)	Pla	anning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K	5850	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R	0.95 3 0	
Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	General Terrain: Grade % Length Up/Down %	Level mi	
Calculate Flow Adjustr	ments				
f_p	1.00		E _R	1.2	
E _T	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
Speed Inputs			Calc Speed Adj and FFS	3	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_LW		mph
Number of Lanes, N	3		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			
LOS and Performance	Measures		Design (N)		
Operational (LOS) $v_p = (V \text{ or DDHV}) / (PHF \times N)$ S $D = v_p / S$	61.0 34.2	pc/h/ln mph pc/mi/ln	$\frac{\text{Design (N)}}{\text{Design LOS}}$ $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$	$f_{HV} \times f_p)$	pc/h/ln mph pc/mi/ln
LOS	D		Required Number of Lanes, N		
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base freed	-	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

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		RA	MPS AND	RAMP JUN	CTIONS W	ORKSH	EET								
General	Infori				Site Infor										
Analyst				Fr	eeway/Dir of Tr		I-95 N	IB							
Agency or Co	mpany	AEC	OM		nction				Oth St EB & W	/B					
Date Perform					lurisdiction										
Analysis Time				Ar	nalysis Year		No-Bu	uild 2020							
	ription	SW 10th Stree	et SIMR												
Inputs			L							1					
Upstream Adj	j Ramp		1	ber of Lanes, N	3					Downstre	am Adj				
1 1 1 1 1 1 1 1 1 1			Ramp Numbe	er of Lanes, N	1					Ramp					
✓ Yes	On		Acceleration I	_ane Length, L _A	1345					□Yes	☐ On				
□No	✓ Off						I No	□ 0 "							
			Freeway Volu	me, V _F	5850					✓ No	Off				
_ _{up} =	1370 f	ŧ	Ramp Volume	e, V _D	1460					L _{down} =	ft				
				-Flow Speed, S _{FF}	70.0					1.					
√ _u =	1070 v	eh/h		low Speed, S _{FR}	50.0					$V_D =$	veh/h				
Camirara	/b	1	- 110	30.0											
convers	ion ic	y pc/n on		Conditions			ı			1					
(pc/h)		v (Veh/hr)	PHF	Terrain	%Truck	%Rv		f _{HV}	f_p	v = V/PHF	$x f_{HV} x f_{p}$				
Freeway		5850	0.95	Level	3	0	().985	1.00	6	250				
Ramp		1460	0.92	Level	2	0	-	0.990	1.00		603				
UpStream		1070	0.92	Level	2	0	_	0.990	1.00		175				
DownStream							1				-				
			Merge Areas		*				iverge Areas						
Estimatio	on of	v ₁₂				Estimat	ion	of v ₁₂							
		V ₁₂ = V _F	(P _{EM})					\/ -\		\D					
-a =		.= .		13-6 or 13-7)				.=	/ _R + (V _F - V _I						
-EQ - - 				tion (Exhibit 13-6)		L _{EQ} =		•	Equation 13		•				
		3402		tion (Exhibit 10-0)		P _{FD} =			sing Equati	on (Exhibit 13	3-7)				
V ₁₂ =			•	on 13-14 or 13-		V ₁₂ =		p	c/h						
V_3 or V_{av34}		17)	pc/ii (Equati	011 13-14 01 13-		V_3 or V_{av34}		p	c/h (Equation	13-14 or 13-1	7)				
Is V ₃ or V _{av34}	2,700) pc/h? 🗹 ́Ye	s 🗌 No			Is V_3 or $V_{av34} > 2,700$ pc/h? \square Yes \square No									
		V ₁₂ /2 ✓ Ye				Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ Yes No									
	+			on 13-16, 13-		If Yes,V _{12a} =		p	c/h (Equatio	on 13-16, 1	3-18, or				
f Yes,V _{12a} =		18, or	13-19)	, -		10-19)									
Capacity	Che	cks				Capacity Checks									
		Actual	(Capacity	LOS F?			Actual	Ca	apacity	LOS F?				
						V_{F}			Exhibit 13	3-8					
V_{FO}		7853	Exhibit 13-8		Yes	$V_{FO} = V_{F}$	- V _R		Exhibit 13	8-8					
- FO		1000	Extribit 10 0		100				Exhibit 13	3-					
						V _R			10						
Flow Ent	<u>tering</u>		fluence A		1	Flow Er	teri		ge Influe						
		Actual	<u> </u>	Desirable	Violation?		+	Actual	Max Des	sirable	Violation?				
V _{R12}		5174	Exhibit 13-8	4600:All	Yes	V ₁₂			Exhibit 13-8						
			nination (1			erminatio	•	<i>F</i>)				
$D_R = 5$	5.475 + (0.00734 v _R +	0.0078 V ₁₂ - 0.	00627 L _A			D _R =	4.252 + 0.	0086 V ₁₂ - 0	0.009 L _D					
O _R = 36.	7 (pc/mi	/ln)				D _R = (pc/mi/ln)									
_OS = F(I	Exhibit 1	3-2)				LOS = (Exhibit 13-2)									
Speed D						Speed Determination									
•						<u>'</u>									
· ·	•	oit 13-11)													
		Exhibit 13-11)													
•		Exhibit 13-11)				S ₀ = mph (Exhibit 13-12)									
S = 49.	9 mph (l	Exhibit 13-13)				S = mph (Exhibit 13-13)									
		FEIorido All Dio								Congreted: E/20/2010					

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	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed	AECOM		Highway/Direction of Travel From/To Jurisdiction	I-95 NB	
Analysis Time Period	AM		Analysis Year	No-Buila	1 2020
Project Description SW 10t	th Street SIMR				
✓ Oper.(LOS))		Des.(N)	□Pla	nning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K	7310	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R	0.95 3 0	
Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	General Terrain: Grade % Length Up/Down %	Level mi	
Calculate Flow Adjusti	ments				
f _p	1.00		E _R	1.2	
E _T	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
Speed Inputs			Calc Speed Adj and FFS	3	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_LW		mph
Number of Lanes, N	3		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			
LOS and Performance	Measures		Design (N)		
Operational (LOS) v _p = (V or DDHV) / (PHF x N S D = v _p / S	x f _{HV} x f _p) 2603 47.2 55.2	pc/h/ln mph pc/mi/ln	Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$	$f_{HV} \times f_p)$	pc/h/ln mph pc/mi/ln
LOS	F		Required Number of Lanes, N		P • · · · · · · · · · · · · · · · · · ·
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base freedour volume	-	E_R - Exhibits 11-10, 11-12 E_T - Exhibits 11-10, 11-11, 11- f_p - Page 11-18 LOS, S, FFS, v_p - Exhibits 11-2		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

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		RAMP	S AND RAM	P JUNCTI	ONS WO	ORKS	HEET			
General Info	rmation			Site Infor	mation					
Analyst				eeway/Dir of Tr	avel	I-95 NE				
Agency or Company	y AEC	OM		inction		Seg 11	-Off Ramp I	Hillsboro EB		
Date Performed Analysis Time Perio	od AM			risdiction nalysis Year		No-Bui	ld 2020			
Project Description		et SIMR	7 11	laryolo i oai		140 Bui	10 2020			
Inputs										
Upstream Adj F	Ramp	Freeway Num	ber of Lanes, N	3					Downstrea	ım Adi
	·	Ramp Number	r of Lanes, N	1					Ramp	,
✓ Yes	✓ On	Acceleration L	ane Length, L _A						☐Yes	On
□No [Off	Deceleration L	ane Length L _D	220					✓ No	Off
		Freeway Volui	ne, V _F	7310						
L _{up} = 30	085 ft	Ramp Volume	, V _R	720					L _{down} =	ft
V ₁₁ = 14	460 veh/h	Freeway Free	-Flow Speed, S _{FF}	70.0					V _D =	veh/h
v _u – 1	400 Ven/II	Ramp Free-Flo	ow Speed, S _{FR}	45.0					ן - ט	7011
Conversion t	to pc/h Un	der Base (Conditions							
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv		f_{HV}	f _p	v = V/PHF	x f _{HV} x f _D
Freeway	7310	0.95	Level	3	0	0.	985	1.00	78	10
Ramp	720	Level	2	0	_	990	1.00	79		
UpStream	1460	Level	2	0	0.	990	1.00	16	03	
DownStream										
		Merge Areas			F - 4'			iverge Areas		
Estimation o	τν ₁₂				Estima	tion o	τν ₁₂			
	$V_{12} = V_{F}$	(P_{FM})					V ₁₂ =	$V_R + (V_F - V_F)$	_R)P _{FD}	
L _{EQ} =	(Equa	ation 13-6 or	13-7)		L _{EQ} =			10.72 (Equati		•
P _{FM} =	using	Equation (E	xhibit 13-6)		P _{FD} =		0.5	528 using Equ	uation (Exhi	bit 13-7)
V ₁₂ =	pc/h				V ₁₂ =		44	99 pc/h		
V ₃ or V _{av34}			-14 or 13-17)		V_3 or V_{av34}			11 pc/h (Equ	ation 13-14	or 13-17)
Is V ₃ or V _{av34} > 2,7								Yes No		
Is V ₃ or V _{av34} > 1.5					Is V ₃ or V _a	_{Iv34} > 1.5		Yes ✓ No		
If Yes,V _{12a} =	pc/h (13-19)		-16, 13-18, or		If Yes,V _{12a} = 5110 pc/h (Equation 13-16, 13-18, or 13-19)					
Capacity Che	<i>'</i>)			Capaci	ty Ch		13-19)		
	Actual	С	apacity	LOS F?	Joapaon	ty Uni	Actual	Ca	pacity	LOS F?
			эрин	1	V _F		7810	Exhibit 13-8	· r	Yes
V_{FO}		Exhibit 13-8			V _{FO} = V		7020	Exhibit 13-8	7200	No
FO					V _R		790	Exhibit 13-1		No
Flow Enterin	a Morae Ir	ofluence A	<u></u>			`		ge Influen		110
. 10W LIILGIIII	Actual		Desirable	Violation?	I IOW E	_	Actual	Max Desirab		Violation?
V _{R12}		Exhibit 13-8			V ₁₂	_	1499	Exhibit 13-8	4400:All	Yes
Level of Serv	<u> </u>				terminatio	n (if not l				
D _R = 5.475 + 0		<u>`</u>						0086 V ₁₂ - 0.		,
D _R = (pc/mi/lr		12	^		$D_R = 4$	16.2 (pc		12	D	
LOS = (Exhibit	•				1		,			
Speed Deter	•				LOS = F (Exhibit 13-2) Speed Determination					
$M_S = $ (Exibit 1					D _s = 0.369 (Exhibit 13-12)					
_	hibit 13-11)				S_R = 59.7 mph (Exhibit 13-12)					
	hibit 13-11)				S_0 = 70.2 mph (Exhibit 13-12)					
	hibit 13-11)				S = 62.9 mph (Exhibit 13-13)					
vright © 2016 Universi	-				5 = 62.9 mpn (EXNIDIT 13-13) Generated: 5/20/2019 12:3					

	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	AECOM AM		Highway/Direction of Travel From/To Jurisdiction Analysis Year	I-95 NB Seg 12-L No-Build	Bet Off & On Hillsboro
Project Description SW 10t	h Street SIMR				
✓ Oper.(LOS)			Des.(N)	□Pla	nning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K	6590	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R	0.95 3 0	
Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	General Terrain: Grade % Length Up/Down %	Level mi	
Calculate Flow Adjustr	ments				
f _p E _T	1.00 1.5		E_{R} $f_{HV} = 1/[1+P_{T}(E_{T}-1)+P_{R}(E_{R}-1)]$	1.2 0.985	
Speed Inputs			Calc Speed Adj and FFS	3	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	3		f _{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			·
LOS and Performance	Measures		Design (N)		
Operational (LOS) v _p = (V or DDHV) / (PHF x N S D = v _p / S LOS	x f _{HV} x f _p) 2347 54.7 42.9 <i>E</i>	pc/h/ln mph pc/mi/ln	Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$ Required Number of Lanes, N	·	pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base freedour volume	-	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

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		F	REEWAY	/ WFAV	ING WOR	KSHFF	T		
Genera	al Informati		KLLWA	WEAV.	Site Info		<u> </u>		
Analyst Agency/Co Date Perfo Analysis T		AECON AM	1		Freeway/Dir of Travel I-95 NB Weaving Segment Location Seg 13-Bet On & Off Hillsbord Analysis Year No-Build 2020				
Project De	escription SW 10t	h Street SIMR							
Inputs									
Weaving n Weaving s Freeway fr	configuration number of lanes, N segment length, L, ree-flow speed, Fl	s FS		790ft 70 mph	Terrain type				Freeway 15 2400 Level
Conve	rsions to po	1	1		î .	I -			(")
	V (veh/h)	PHF	Truck (%)	RV (%)	E _T	E _R	f _{HV}	f _p	v (pc/h)
V _{FF}	6000	0.95	3	0	1.5	1.2	0.985	1.00	6411
V _{RF}	560	0.92	2	0	1.5	1.2	0.990	1.00	615
V_{FR}	590	0.92	2	0	1.5	1.2	0.990	1.00	648
V_{RR}	0	0.95	2	0	1.5	1.2	0.990	1.00	0
V_{NW}	6411							V =	7674
V_{W}	1263								
VR	0.165								
Config	uration Cha	aracterist	ics		I				
	maneuver lanes,	N_{WL}		2 lc		_	nanges, LC _{MIN}		1263 lc/h
	ge density, ID				Weaving lan	_	**		1474 lc/h
	RF lane changes,	14		1 lc/pc	Non-weaving				978 lc/h
	FR lane changes,			1 lc/pc	Total lane ch	nanges, LC _{ALI}	_		2452 lc/h
Minimum	RR lane changes	, LC _{RR}		lc/pc	Non-weaving	g vehicle inde	ex, I _{NW}		355
Weavir	ng Segmen	t Speed, l	Density, I	_evel of	Service,	and Cap	acity		
	segment flow rate segment capacity.			7566 veh/h 8437 veh/h	Weaving seg	ensity factor, gment speed,	S		0.552 51.5 mph 50.4 mph
	0 0					³ "			
_	Weaving segment density, D 37.3 pc/mi/								
	Service, LOS			E	Maximum weaving length, L _{MAX} 4177				
Notes									

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F". Copyright © 2016 University of Florida, All Rights Reserved

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	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed	AECOM		Highway/Direction of Travel From/To Jurisdiction	I-95 NB Seg 14-	Bet Off & On Hillsboro
Analysis Time Period	AM		Analysis Year	No-Build	1 2020
Project Description SW 10t	th Street SIMR				
✓ Oper.(LOS))		Des.(N)	Pla	anning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K	6560	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R	0.95 3 0	
Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	General Terrain: Grade % Length Up/Down %	Level mi	
Calculate Flow Adjusti	ments				
f _p	1.00		E _R	1.2	
E _T	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
Speed Inputs			Calc Speed Adj and FFS	3	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	3		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			
LOS and Performance	Measures		Design (N)		
Operational (LOS) v _p = (V or DDHV) / (PHF x N S D = v _p / S	55.0 42.4	pc/h/ln mph pc/mi/ln	Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$	$f_{HV} \times f_p)$	pc/h/ln mph pc/mi/ln
LOS	E		Required Number of Lanes, N		
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base freedour volume	-	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

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		F	REEWAY	/ WEAVI	NG WOF	RKSHEE	т		
Gener	al Information				Site Info		<u> </u>		
Analyst Agency/C Date Perfo Analysis 1		AECON AM	Л		Freeway/Dir of Travel I-95 NB Weaving Segment Location Seg 15-Bet On & Off to Exp Analysis Year No-Build 2020				
	escription SW 10th	n Street SIMR	}						
Inputs					1				
Weaving i Weaving s Freeway f	configuration number of lanes, N segment length, L _s ree-flow speed, FF	s FS		4665ft 70 mph	Terrain type				Freeway 15 2400 Leve
Conve	rsions to po		1	T .	î .		1 ,		(n a/b)
.,	V (veh/h)	PHF	Truck (%)	RV (%)	E _T	E _R	f _{HV}	fp	v (pc/h)
V _{FF}	5275	0.95	3	0	1.5	1.2	0.985	1.00	5636
V _{RF}	635	0.92	2	0	1.5	1.2	0.990	1.00	697
V _{FR}	1285	0.92	2	0	1.5	1.2	0.990	1.00	1411
V _{RR}	75	0.92	2	0	1.5	1.2	0.990	1.00	82
V_{NW}	7744							V =	7826
V_W	82								
VR	0.010	<u> </u>							
	uration Cha		IICS		I				
	maneuver lanes, I	N_{WL}		0 lc		-	hanges, LC _{MIN}		lc/h
	ge density, ID				Weaving lan	-	**		lc/h
	RF lane changes,	1.0			Non-weaving				lc/h
	FR lane changes,			0 lc/pc		nanges, LC _{AL}	-		lc/h
Minimum	RR lane changes,	LC _{RR}		3 lc/pc	Non-weaving	g vehicle inde	ex, I _{NW}		
Weavi	ng Segment	Speed,	Density, l	Level of	i .				
Ŭ	segment flow rate,			7722 veh/h	_	ensity factor,			
	segment capacity,	c_{w}		6831 veh/h	Assessment of the second of th				mph
	/eaving segment v/c ratio 1.13					• .	**		mph mph
_	Neaving segment density, D pc/mi/lr Level of Service, LOS F					.			
Notes	JOI VICO, LOO			ı	iviaximum W	eaving lengtr	I, L _{MAX}		5824 ft

Notes

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a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	AECOM AM		Highway/Direction of Travel From/To Jurisdiction Analysis Year	I-95 NB Seg 16-I No-Build	North of Hillsboro
Project Description SW 10t	h Street SIMR				
✓ Oper.(LOS))		Des.(N)	□Pla	nning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D	5910	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain:	0.95 4 0 Level	
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	mi	
Calculate Flow Adjustr	ments				
f _p E _T	1.00 1.5		E_R $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	1.2 0.980	
Speed Inputs			Calc Speed Adj and FFS	3	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	3		f _{LC}		mph
Total Ramp Density, TRD	•	ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph		70.0	трп
LOS and Performance	Measures		Design (N)		
Operational (LOS) v _p = (V or DDHV) / (PHF x N S D = v _p / S LOS	x f _{HV} x f _p) 2115 60.3 35.1 E	pc/h/ln mph pc/mi/ln	Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$ Required Number of Lanes, N	$f_{HV} \times f_p$)	pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base freedour volume	-	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

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			REEWAY	WEAV	NG WOR	RKSHEE	T			
Genera	l Informatio	on			Site Info	rmation				
Analyst Agency/Co Date Perfoi Analysis Tii	med	AECON PM	М		Freeway/Dir of Travel I-95 NB Weaving Segment Location Seg 1-Bet Copans & Sample Analysis Year No-Build 2020					
Project Des	scription SW 10th	n Street SIMF	₹		<u> </u>					
Inputs					1					
Weaving no Weaving se Freeway fre	onfiguration umber of lanes, N egment length, L _s ee-flow speed, FF	s FS		1820ft 70 mph	Segment type Freeway min Freeway max Terrain type	imum speed			Freeway 18 2400 Leve	
Conver	sions to po	PHF		ı	1		1 4	١ ،	\(\(\langle \n \n \langle \langle \)	
\/	V (veh/h) 4400	0.95	Truck (%)	RV (%)	E _T	E _R	f _{HV} 0.985	f _p	v (pc/h) 4701	
V _{FF}	-			0						
V _{RF}	410	0.92	2	0	1.5	1.2	0.990	1.00	450	
V _{FR}	1570	0.92	2	0	1.5	1.2	0.990	1.00	1724	
V _{RR}	0	0.92	0	0	1.5	1.2	1.000	1.00	0	
V _{NW}	4701							V =	6875	
V _W	2174									
VR Configu	0.316 uration Cha	<u> </u> racterist	tics							
	naneuver lanes, i		1103	2 lc	Minimum we	aving lane c	hanges, LC _{MIN}		2174 lc/h	
	e density, ID	* WL			Weaving land	-	- 14111	I	2546 lc/h	
_	RF lane changes,	LCpc			Non-weaving	_	••		1184 lc/h	
	R lane changes,	14		·	Total lane ch				3730 lc/h	
	RR lane changes,	111			Non-weaving		=		599	
	g Segment		Density, I							
Neaving segment flow rate, v 6784 veh					Weaving intensity factor, W				0.398 48.4 mph	
		C _w		7478 veh/h 0.907	//II				54.3 mph	
•	Veaving segment v/c ratio 0.9 Veaving segment density, D 35.5 pc/mi									
	Level of Service, LOS					Maximum weaving length, L _{MAX} 5759				
Notes					<u> </u>		INIOV			

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a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

	BASIC	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst			Highway/Direction of Travel	I-95 NB	
Agency or Company	AECOM		From/To		et Off & On from
Date Performed			Jurisdiction	Sample	
Analysis Time Period	PM		Analysis Year	No-Buila	1 2020
Project Description SW 10th	Street SIMR				
✓ Oper.(LOS)			Des.(N)	☐ Pla	nning Data
Flow Inputs					_
Volume, V	4810	veh/h	Peak-Hour Factor, PHF	0.95	
AADT		veh/day	%Trucks and Buses, P _T	3	
Peak-Hr Prop. of AADT, K			%RVs, P _R	0	
Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	General Terrain: Grade % Length	Level mi	
JUIN - MADI XIXX		VCII/II	Up/Down %	1111	
Calculate Flow Adjustm	nents		· · · · · · · · · · · · · · · · · · ·		
f _p	1.00		 E _R	1.2	
E _T	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
	7.0		• • • • • • • • • • • • • • • • • • • •		
Speed Inputs			Calc Speed Adj and FFS	<u> </u>	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f _{LW}		mph
Number of Lanes, N	3		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			
LOS and Performance I	Measures		Design (N)		
			Design (N)		
Operational (LOS)			Design LOS		
v _p = (V or DDHV) / (PHF x N x	(f _{HV} x f _p) 1713	pc/h/ln	$v_p = (V \text{ or DDHV}) / (PHF \times N \times N)$	$(f_{uv}, x f_{n})$	pc/h/ln
8	66.9	mph	S	пу р⁄	mph
$D = v_p / S$	25.6	pc/mi/ln	D = v _p / S		pc/mi/ln
LOS	С		Required Number of Lanes, N		P 5
Glossary			Factor Location		
N - Number of lanes	S - Speed				
V - Hourly volume	D - Density		E _R - Exhibits 11-10, 11-12		f _{LW} - Exhibit 11-8
v - Hourly volume v _n - Flow rate	FFS - Free-flow	, sneed	E _T - Exhibits 11-10, 11-11, 11-	-13	f _{LC} - Exhibit 11-9
OS - Level of service	BFFS - Base fr	-	f _p - Page 11-18		TRD - Page 11-1
DDHV - Directional design ho		ce-now speeu	LOS, S, FFS, v _p - Exhibits 11-	2, 11-3	
יום - אדוםם ווייי איזיםם וויייייייייייייייייייייייייייייייי	ui voiuille		·		_

		RA	MPS AND	RAMP JUN	CTIONS W	/ORKSHI	EET				
General	I Infor				Site Infor						
Analyst				Fi	reeway/Dir of Tr		I-95 N	JB			
Agency or C	Company	AEC	OM		unction				rom Sample		
Date Perfori		,0	•		urisdiction			. Оп. пар .			
Analysis Tin	ne Period	l PM		A	nalysis Year		No-Bu	uild 2020			
Project Des	cription	SW 10th Stree	et SIMR								
Inputs											
Upstream A	di Ramn		Freeway Num	ber of Lanes, N	3					Downstre	am Adi
Opsilealii A	iaj italiip		Ramp Numbe	er of Lanes, N	1					Ramp	ani Auj
☐ Yes	☐ On	1	1	ane Length, L _A	500					1	
			1	,,	300					✓ Yes	✓ On
✓ No		f	1	Lane Length L _D						☐ No	Off
			Freeway Volu	•	4810					_	
L _{up} =	ft		Ramp Volume	e, V _R	970					L _{down} =	1950 ft
.,			Freeway Free	-Flow Speed, S _{FF}	70.0					V _D =	730 veh/h
V _u =	veh/h		Ramp Free-F	low Speed, S _{FR}	50.0					v _D –	730 Ven/m
Conver	sion to	n nc/h l ln		Conditions							
		γ γ ο / 			0	215	T	,	•		- <i>'</i>
(pc/l	h)	(Veh/hr)	PHF	Terrain	%Truck	%Rv		f _{HV}	f _p	v = V/PH	$F x f_{HV} x f_{p}$
Freeway		4810	0.95	Level	3	0	(0.985	1.00		5139
Ramp		970	0.92	Level	2	0	1	0.990	1.00		1065
UpStream							1				
DownStrea	m	730	0.92	Level	2	0	(0.990	1.00		801
			Merge Areas						Diverge Areas	<u>I</u>	
Estimat	ion of					Estimat	ion	of v ₁₂			
		V ₁₂ = V _F	/ D \								
_			• •••	. 40.7)				$V_{12} = {}^{\circ}$	$V_R + (V_F - V_1)$	$_{R})P_{FD}$	
L _{EQ} =			ation 13-6 o	-		L _{EQ} =			(Equation 13	-12 or 13-	13)
P _{FM} =		0.591	using Equa	tion (Exhibit 13-6))	P _{FD} =		1	using Equati	on (Exhibit 1	3-7)
V ₁₂ =		3040	•			V ₁₂ =			pc/h	·	,
V ₃ or V _{av34}			pc/h (Equati	on 13-14 or 13-	-	V ₃ or V _{av34}			pc/h (Equation	13-1/Lor 13-	17)
		17)	_				> 2		Yes □ No		11)
		0 pc/h? ☐ Ye									
Is V ₃ or V _{av}	_{/34} > 1.5 *	V ₁₂ /2 ∨ Ye	s 🗌 No			is v ₃ or v _{av}	34 > 1.	.5 " V ₁₂ /2 [Yes No) 10 10 1	10.40
If Yes,V _{12a} =	=			on 13-16, 13-		If Yes,V _{12a} =	=		pc/h (Equatio 3-19)	on 13-16, 1	13-18, Or
			13-19)								
Capacit	y Che	*			,	Capacit	y Cr	1	r		
		Actual	(Capacity	LOS F?	<u> </u>		Actual		apacity	LOS F?
						V_{F}			Exhibit 13	-8	
V _F	0	6204	Exhibit 13-8		No	$V_{FO} = V_{F}$	- V_R		Exhibit 13	-8	
F'	O					V_R			Exhibit 13	3-	
						VR €			10		
Flow Er	<u>tering</u>	Merge In	Ú.			Flow En	teri	ng Dive	rge Influe		"
		Actual	-	Desirable	Violation?		\bot	Actual	Max De	sirable	Violation?
V_{R1}	2	4105	Exhibit 13-8	4600:All	No	V ₁₂			Exhibit 13-8		
		ice Deterr	nination (if not F)		Level of	^F Sei	rvice De	terminatio	on (if not	t 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	0.009 L _D	
• •	3.9 (pc/m		12	7.			oc/mi/		12	D	
11	(Exhibit	,						•			
	•					LOS = (Exhibit 13-2)					
Speed L	Jetern	nination				Speed L			on		
$M_S = 0$.508 (Exil	oit 13-11)				$D_s = (E$	xhibit	13-12)			
_	5.8 mph (Exhibit 13-11)				S _R = mph (Exhibit 13-12)					
		Exhibit 13-11)				S ₀ = mph (Exhibit 13-12)					
°	· · ·						S = mph (Exhibit 13-13)				
o		•				S = mpn (Exhibit 13-13)					

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	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst			Highway/Direction of Travel	I-95 NB	
Agency or Company	AECOM		From/To	•	et On from Sample &
Date Performed			Jurisdiction	Exp	
Analysis Time Period	PM		Analysis Year	No-Buila	1 2020
Project Description SW 10th	Street SIMR				
✓ Oper.(LOS)			Des.(N)	☐ Pla	nning Data
Flow Inputs					_
Volume, V	5780	veh/h	Peak-Hour Factor, PHF	0.95	
AADT		veh/day	%Trucks and Buses, P _T	3	
Peak-Hr Prop. of AADT, K			%RVs, P _R	0	
Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	General Terrain: Grade % Length	Level mi	
DDIIV TVIDI XIXXD		VOIDII	Up/Down %	****	
Calculate Flow Adjustm	nents		·		
f _p	1.00		E _R	1.2	
E _T	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
 Speed Inputs			Calc Speed Adj and FFS		
			Oale Opeea Auj and TT		
Lane Width		ft	f f		ma m la
Rt-Side Lat. Clearance		ft	f _{LW}		mph
Number of Lanes, N	3		f _{LC}		mph
Total Ramp Density, TRD	70.0	ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			
LOS and Performance I	Measures		Design (N)		
Operational (LOC)			Design (N)		
Operational (LOS)	ef v(f) 0050	No No	Design LOS		
v _p = (V or DDHV) / (PHF x N x	··· P	pc/h/ln	$v_p = (V \text{ or DDHV}) / (PHF x N x)$	$f_{HV} \times f_{D}$	pc/h/ln
S / 0	61.5	mph	S	r	mph
D = v _p / S	33.5	pc/mi/ln	$D = v_p / S$		pc/mi/ln
LOS	D		Required Number of Lanes, N		
Glossary			Factor Location		
N - Number of lanes	S - Speed				_
V - Hourly volume	D - Density		E _R - Exhibits 11-10, 11-12		f _{LW} - Exhibit 11-8
v _n - Flow rate	FFS - Free-flow	speed	E _T - Exhibits 11-10, 11-11, 11-	·13	f _{LC} - Exhibit 11-9
LOS - Level of service	BFFS - Base from	-	f _p - Page 11-18		TRD - Page 11-11
DDHV - Directional design ho		•	LOS, S, FFS, v _p - Exhibits 11-	2, 11-3	
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	RA	MPS AND	RAMP JUN	CTIONS W	ORKSHI	EET					
General Info				Site Infor							
Analyst			Fr	eeway/Dir of Tr		I-95 N	IB				
Agency or Compa	iny AEC	OM		inction			i-On from Ex	(D			
Date Performed	,			ırisdiction	OUG O OH HOM EXP						
Analysis Time Per	riod PM		Ar	nalysis Year		No-Bu	uild 2020				
Project Description	n SW 10th Stree	et SIMR									
Inputs											
Upstream Adj Rar	mn	Freeway Nun	ber of Lanes, N	3					Downstre	am Adi	
opolioum / laj r lai		Ramp Numbe	er of Lanes, N	1					Ramp	, ann , taj	
Yes 🔲	On	Acceleration	_ane Length, L _△	600					✓ Yes	☐ On	
	0.55		Lane Length L _D								
✓ No	Off	Freeway Volu	- 5	5780					☐ No	✓ Off	
L _{up} = ft			•						L _{down} =	5545 ft	
-up		Ramp Volume	11	730					down		
V _u = veł	n/h		e-Flow Speed, S _{FF}	70.0					$V_D =$	1300 veh/h	
			low Speed, S _{FR}	50.0							
Conversion	to pc/h Un	der Base	Conditions								
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv		f_HV	f _p	v = V/PH	F x f _{HV} x f _p	
. ,	 	0.05	Loval	2	0	+ ,		1.00		6175	
Freeway Ramp	5780 730	0.95 0.92	Level Level	2	0	_	0.985 0.990	1.00	_	801	
UpStream	730	0.92	Level	<u> </u>	U	+	J.990	1.00		001	
DownStream	1300	0.92	Level	2	0	+ (0.990	1.00		1427	
Downoticani	1000	Merge Areas	Level		0			Diverge Areas		1721	
Estimation	of V ₄₂	orgo / arouc			Estimati	ion	of V ₄₂	gorouc			
		/ D \					12				
_	$V_{12} = V_{F}$		10.0 10.7)				$V_{12} = 0$	$V_R + (V_F - V_F)$	_R)P _{FD}		
L _{EQ} =			13-6 or 13-7)		L _{EQ} =		((Equation 13	-12 or 13-	13)	
P _{FM} =			tion (Exhibit 13-6)		P _{FD} =		į	using Equation	on (Exhibit 1	3-7)	
V ₁₂ =	3806	•			V ₁₂ =			pc/h			
V ₃ or V _{av34}		pc/h (Equati	on 13-14 or 13-		V ₃ or V _{av34}			pc/h (Equation	13-14 or 13-	17)	
Is V ₃ or V _{av34} > 2	17) 700 nc/h2 □ ∨c	No. II No.				₂₄ > 2,		□Yes □ No			
								□Yes □ No			
Is V_3 or $V_{av34} > 1$			on 10 16 10				12 L	pc/h (Equatio	, on 13-16, 1	13-18, or	
If Yes,V _{12a} =		pc/n (Equati · 13-19)	on 13-16, 13-		If Yes,V _{12a} =			3-19) ်	,	,	
Capacity Cl		10 10)			Capacit	v Cł	necks				
	Actual		Capacity	LOS F?		,	Actual	Ca	apacity	LOS F?	
					V _F			Exhibit 13			
.,	2070	F 1 7 7 40 0		l	$V_{FO} = V_{F}$	- V_		Exhibit 13			
V_{FO}	6976	Exhibit 13-8		No		*R		Exhibit 13			
					V_R			10	<u> </u>		
Flow Enteri	na Merae II	nfluence A	\rea		Flow En	teri	na Dive	rge Influei	nce Area)	
	Actual	-0	Desirable	Violation?		T	Actual	Max Des		Violation?	
V _{R12}	5063	Exhibit 13-8	4600:All	Yes	V ₁₂			Exhibit 13-8			
	rvice Deteri			<u> </u>		Ser	vice De	terminatio	on (if no	t F)	
	5 + 0.00734 v _R +				1			.0086 V ₁₂ - 0		,	
$D_{R} = 40.8 (pc$	• • • • • • • • • • • • • • • • • • • •	- 12	А			c/mi/		12	υ υ		
LOS = E (Exhil	,						•				
`					LOS = (Exhibit 13-2)						
Speed Dete	rmination				Speed Determination						
M _S = 0.877 (E	Exibit 13-11)				,		13-12)				
S _R = 45.4 mբ	oh (Exhibit 13-11)				S _R = mph (Exhibit 13-12)						
	oh (Exhibit 13-11)				S ₀ = mph (Exhibit 13-12)						
	, ,						S = mph (Exhibit 13-13)				
ht ⊜ 2016 Linivoroi										nd: E/20/2010 1	

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	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	AECOM PM		Highway/Direction of Travel From/To Jurisdiction Analysis Year	I-95 NB Seg 6-B No-Build	et Exp On & Off to 10th
Project Description <i>I-95 A7</i>		III FVARD IMR	Allalysis Teal	TVO-Dana	7 2020
✓ Oper.(LOS			Des.(N)	□Pla	anning Data
Flow Inputs	,		200.()		
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D	6510	veh/h veh/day veh/h	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade % Length Up/Down %	0.95 3 0 Level mi	
Calculate Flow Adjust	ments				
f _p E _T	1.00 1.5		E_R $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	1.2 0.985	
Speed Inputs			Calc Speed Adj and FFS	<u> </u>	
Lane Width		ft	<u> </u>		
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	3		f _{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured) Base free-flow Speed, BFFS	70.0	mph mph	FFS	70.0	mph
LOS and Performance	Measures		Design (N)		
Operational (LOS) v _p = (V or DDHV) / (PHF x N S D = v _p / S LOS	x f _{HV} x f _p) 2318 55.5 41.8 E	pc/h/ln mph pc/mi/ln	Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$ Required Number of Lanes, N	$f_{HV} \times f_p$)	pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design h	S - Speed D - Density FFS - Free-flow BFFS - Base fro	-	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

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		RAMP	S AND RAM			RKS	HEET			
General Info	ormation			Site Infor						
Analyst				eeway/Dir of Tr	avel	I-95 NE				
Agency or Compa	ny AEC	COM		nction		Seg 7-	Off Ramp to	o 10th St		
Date Performed Analysis Time Per	iod PM			risdiction alysis Year		No-Rui	ild 2020			
Project Description		et SIMR	741	lary 515 T Car		NO-Dui	110 Z0Z0			
Inputs										
Upstream Ad	i Ramp	Freeway Num	ber of Lanes, N	3					Downstre	am Adj
	•	Ramp Numbe	r of Lanes, N	1					Ramp	•
Yes	On	Acceleration L	ane Length, L _A						✓ Yes	☑ On
✓ No	Off	Deceleration L	ane Length L _D	250					□No	Off
_		Freeway Volu	me, V _F	6510						
L _{up} =	ft	Ramp Volume	, V _R	1300					L _{down} =	1370 ft
V -	vab/b	Freeway Free	-Flow Speed, S _{FF}	70.0					V _D =	1160 veh/h
V _u =	veh/h	Ramp Free-Fl	ow Speed, S _{FR}	45.0					l D	1100 VCII/I
Conversion	to pc/h Un	der Base (Conditions							
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv		f_{HV}	f_p	v = V/PH	F x f _{HV} x f _p
Freeway	6510	0.95	Level	3	0	_	.985	1.00		955
Ramp	1300	0.92	Level	2	0	_	.990	1.00		427
UpStream	1000	0.02	2070.		Ť	<u> </u>	.000	1.00		121
DownStream	1160	0.92	Level	2	0	0.	.990	1.00	1	273
		Merge Areas						iverge Areas		
Estimation	of v ₁₂				Estimat	tion o	of v ₁₂			
	V ₁₂ = V _F	(P _{FM})					V ₁₂ =	· V _R + (V _F - V _F	R)P _{FD}	
- _{EQ} =	(Equ	ation 13-6 or	13-7)		L _{EQ} =		(Equation 13-1	2 or 13-1	3)
P _{FM} =		g Equation (E	•		P _{FD} =		•	520 using Equ		•
/ ₁₂ =	pc/h	, – 4.0.0.0 (-			V ₁₂ =			804 pc/h		
/ ₃ or V _{av34}	•	(Equation 13	-14 or 13-17)		V ₃ or V _{av34}			651 pc/h (Equ	ation 13 ₋ 1	14 or 13 ₋ 17)
ls V ₃ or V _{av34} > 2,	-	•	110110117			> 2 7		∃Yes ☑No	ation 15-	14-01-10-17)
Is V_3 or $V_{av34} > 1$.								Yes ✓ No		
			-16, 13-18, or					□ res ເຂົ້າທີ່ c/h (Equation	13-16 13	3-18 or 13-
f Yes,V _{12a} =	13-19		,,		If Yes,V _{12a}		19		10 10, 10	7 10, 01 10
Capacity Cl					Capacit	ty Ch	ı			
	Actual	C	apacity	LOS F?	· .,		Actual		pacity	LOS F?
					V _F		6955	Exhibit 13-8		No
V_{FO}		Exhibit 13-8			$V_{FO} = V_{FO}$		5528	Exhibit 13-8	7200	No
					V _R		1427	Exhibit 13-1	0 2100	No
Flow Enteri					Flow E	nterin	g Dive	rge Influen		1
	Actual		Desirable	Violation?		_	Actual	Max Desirab		Violation?
V _{R12}		Exhibit 13-8			V ₁₂		4304	Exhibit 13-8	4400:All	No
Level of Sei		•						terminatio		<i>F)</i>
$D_R = 5.475 +$	0.00734 v _R +	0.0078 V ₁₂ -	0.00627 L _A			$D_R = 4$	4.252 + 0	.0086 V ₁₂ - 0.	009 L _D	
O _R = (pc/mi/	/ln)				$D_R = 3$	9.0 (pc	/mi/ln)			
OS = (Exhib	it 13-2)				LOS = E	(Exhil	bit 13-2)			
Speed Dete	rmination				Speed I	Deter	minatio	on		
M _S = (Exibit	13-11)				$D_s = 0$.426 (E	xhibit 13-	-12)		
	•				1	8.1 mph	(Exhibit	13-12)		
S _R = mph (E	ATTIDIC 13-11)									
	-				$S_0 = 7$	0.4 mph	ı (Exhibit	13-12)		
$S_0 = mph (E$	xhibit 13-11) xhibit 13-11) xhibit 13-13)				ľ	-	n (Exhibit n (Exhibit	·		

	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed	AECOM		Highway/Direction of Travel From/To Jurisdiction	I-95 NB Seg 8-B	et Off & On 10th St
Analysis Time Period	PM		Analysis Year	No-Buila	1 2020
Project Description SW 10th	h Street SIMR				
✓ Oper.(LOS)			Des.(N)	□Pla	nning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K	5210	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R	0.95 3 0	
Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	General Terrain: Grade % Length Up/Down %	Level mi	
Calculate Flow Adjustn	nents				
f _p	1.00		E _R	1.2	
É _T	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
Speed Inputs			Calc Speed Adj and FFS	3	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_LW		mph
Number of Lanes, N	3		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			
LOS and Performance	Measures		Design (N)		
Operational (LOS) v _p = (V or DDHV) / (PHF x N x S	x f _{HV} x f _p) 1855 65.0	pc/h/ln mph	Design (N) Design LOS v _p = (V or DDHV) / (PHF x N x	$f_{HV} \times f_p$)	pc/h/ln
D = v _p / S	28.5	pc/mi/ln	S		mph
LOS	D	ролипп	$D = v_p / S$		pc/mi/ln
			Required Number of Lanes, N		
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base fre	-	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

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	RA	MPS AND	RAMP JUN	CTIONS W	ORKSHE	EET				
General Info				Site Infor						
Analyst			Fr	eeway/Dir of Tr		I-95 N	IB			
Agency or Company	/ AEC	OM		inction				0th St EB & W	/B	
Date Performed				risdiction						
Analysis Time Perio	d PM		Ar	Analysis Year No-Build 2020						
Project Description	SW 10th Stree	et SIMR								
Inputs										
Upstream Adj Ramp)	Freeway Num	ber of Lanes, N	3					Downstre	am Adi
		Ramp Numbe	r of Lanes, N	1					Ramp	-
✓ Yes ☐ O	n	Acceleration L	ane Length, L₄	1345					□Yes	☐ On
		1	ane Length L _D							
□ No ☑ Of	П	Freeway Volu	- 5	5210					✓ No	Off
L _{up} = 1370	ft	1	•						L _{down} =	ft
-ир 1070		Ramp Volume		1160					down	
V _u = 1300	veh/h		-Flow Speed, S _{FF}	70.0					V _D =	veh/h
			ow Speed, S _{FR}	50.0						
Conversion t	to pc/h Un	der 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	<u> </u>	0.05	Loval	3	0	_).985	1.00	-	5566
				2	0	_	0.985			1273
Ramp UpStream	1300	0.92	Level	2	0	$\overline{}$	0.990	1.00		1 <u>273</u> 1427
DownStream	1300	0.92	Level		0	+	J.990	1.00		1421
Downotream		Merge Areas						Diverge Areas		
Estimation o		g			Estimati	ion (of V ₄₂	g		
		/ D \					12			
_	$V_{12} = V_{F}$		10.0 10.7)				$V_{12} = 0$	$V_R + (V_F - V_F)$	$_{R})P_{FD}$	
- _{EQ} =			13-6 or 13-7)		L _{EQ} =		((Equation 13	3-12 or 13-1	3)
P _{FM} =			tion (Exhibit 13-6)		P _{FD} =		į	using Equati	on (Exhibit 1	3-7)
/ ₁₂ =	3106	-			V ₁₂ = pc/h					
V_3 or V_{av34}		pc/h (Equati	on 13-14 or 13-		V ₃ or V _{av34}			pc/h (Equation	13-14 or 13-1	17)
Is V ₃ or V _{av34} > 2,70	17) ∩∩ nc/h2 □ ∨o	o Mo				, > 2,		□Yes □ No		
								□Yes □ No		
Is V_3 or $V_{av34} > 1.5$			on 10 16 10				12 L	pc/h (Equation	on 13-16, 1	3-18, or
f Yes,V _{12a} =		pc/n (Equali 13-19)	on 13-16, 13-		If Yes,V _{12a} =	i		3-19) '	,	•
Capacity Che		,			Capacity	v Ch	necks			
	Actual		Capacity	LOS F?			Actual	Ca	apacity	LOS F?
			-		V _F			Exhibit 13		
	2000	E 1 11 11 40 0		l ,	$V_{FO} = V_{F}$	- V-		Exhibit 13		
V_{FO}	6839	Exhibit 13-8		No		*R		Exhibit 13		
					V_R			10	J-	
Flow Enterin	a Merae Ir	fluence A	rea	•	Flow En	terii	na Dive	rge Influe	nce Area	
	Actual	- O	Desirable	Violation?		Τ	Actual	Max De		Violation?
V _{R12}	4453	Exhibit 13-8	4600:All	No	V ₁₂			Exhibit 13-8		
Level of Serv	rice Deterr		if not F)			Ser	vice De	terminatio	on (if not	F)
	+ 0.00734 v _R +				-			.0086 V ₁₂ - 0	· .	·
D _R = 31.2 (pc/n		12	A			c/mi/		12	U	
OS = D (Exhibit	•						it 13-2)			
`		· `								
•	Speed Determination						rminatio)[]		
$M_{\rm S} = 0.521 ({\rm Ex}$	s = 0.521 (Exibit 13-11)						13-12)			
S _R = 55.4 mph	(Exhibit 13-11)				S _R = mph (Exhibit 13-12)					
	(Exhibit 13-11)				S ₀ = mph (Exhibit 13-12)					
	(Exhibit 13-13)				S = m	ph (Ex	(hibit 13-13)			
ht @ 2016 University	(FL. 11. All Di									d: E/20/2010

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	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed	AECOM		Highway/Direction of Travel From/To Jurisdiction	I-95 NB	
Analysis Time Period	PM		Analysis Year	No-Buila	1 2020
Project Description SW 10th	h Street SIMR				
✓ Oper.(LOS))		Des.(N)	Pla	nning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K	6370	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R	0.95 3 0	
Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	General Terrain: Grade % Length Up/Down %	Level mi	
Calculate Flow Adjustr	ments				
f _p	1.00		E _R	1.2	
E _T	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
Speed Inputs			Calc Speed Adj and FFS	3	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_LW		mph
Number of Lanes, N	3		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			
LOS and Performance	Measures		Design (N)		
Operational (LOS) v _p = (V or DDHV) / (PHF x N) S	56.7	pc/h/ln mph	Design (N) Design LOS v _p = (V or DDHV) / (PHF x N x S	$f_{HV} \times f_p)$	pc/h/ln mph
D = v _p / S LOS	40.0 E	pc/mi/ln	$D = v_p / S$ Required Number of Lanes, N		pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base freedour volume	-	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

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		RAMP	S AND RAM			RKS	HEET			
General Info	rmation			Site Infor	mation					
Analyst				eeway/Dir of Tr	avel I	I-95 NB				
Agency or Company	y AEC	OM		nction						
Date Performed Analysis Time Perio	od PM			risdiction alysis Year		No Buil	d 2020			
Project Description		≥t SIMR		alysis i cal	<u> </u>	NO-Duli	u 2020			
Inputs	OVV TOUT OUC	J. Olivii V								
Upstream Adj F	Ramp	Freeway Num	ber of Lanes, N	3					Downstre	eam Adi
	р	Ramp Number	r of Lanes, N	1					Ramp	- C
✓ Yes	✓ On	Acceleration L	ane Length, L _A						Yes	On
□ No [Off	Deceleration L	ane Length L _D	220					✓ No	Off
		Freeway Volui	ne, V _F	6370						
L _{up} = 30	085 ft	Ramp Volume	, V _R	680					L _{down} =	ft
		Freeway Free	-Flow Speed, S _{FF}	70.0					\/ =	veh/h
$V_u = 1$	160 veh/h	1	ow Speed, S _{FR}	45.0					V _D =	ven/n
Conversion	to pc/h Un	der Base (Conditions							
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv		f_HV	fp	v = V/PH	F x f _{HV} x f _p
Freeway	6370	0.95	Level	3	0	10	985	1.00		
Ramp	680	0.92	Level	2	0		990	1.00		747
UpStream	1160	0.92	Level	2	0		990	1.00		1273
DownStream	1100	0.52	LCVCI			1 0.	330	1.00		1210
200		Merge Areas					D	iverge Areas		
Estimation o	of v ₁₂	•			Estimati	on o		•		
	V ₁₂ = V _F	(P _{EM})					V ₄₀ =	V _R + (V _F - V _F	.)P _{ED}	
-o =		ation 13-6 or	13-7)		L _{EQ} =			54.65 (Equation		or 13-13)
_ _{EQ} = D =		Equation (E	•							-
P _{FM} =	_	Lqualion (L	-XIIIDIL 13-0)		P _{FD} =			555 using Equ	iation (Ex	111011 13-1)
/ ₁₂ =	pc/h	·= ·:	44 40 4=)		V ₁₂ =			13 pc/h		
V_3 or V_{av34}	•		-14 or 13-17)		V ₃ or V _{av34}			93 pc/h (Equa	ation 13-	14 or 13-17)
Is V_3 or $V_{av34} > 2.7$						•		Yes ✓ No		
Is V_3 or $V_{av34} > 1.5$					Is V ₃ or V _{av3}	₄ > 1.5		Yes ✓ No		
f Yes,V _{12a} =	pc/h 13-19		-16, 13-18, or		If Yes,V _{12a} =		po 19	c/h (Equation))	13-16, 1	3-18, or 13-
Capacity Ch		/						· /		
capacity CII	ecks				Capacity	/ Che	ecks			
Capacity CII	Actual	С	apacity	LOS F?	Capacity	/ Che	Actual	Ca	pacity	LOS F?
Capacity CII		C	apacity	LOS F?	Capacity V _F	/ Che		Ca Exhibit 13-8	1	
		C Exhibit 13-8	apacity	LOS F?			Actual		7200	No
V _{FO}			apacity	LOS F?	V_F $V_{FO} = V_F$		Actual 6806	Exhibit 13-8	7200 7200	No No
V _{FO}	Actual	Exhibit 13-8		LOS F?	V_F $V_{FO} = V_F$ V_R	- V _R	Actual 6806 6059 747	Exhibit 13-8 Exhibit 13-8 Exhibit 13-10	7200 7200 2100	No No No
V _{FO}	Actual	Exhibit 13-8		LOS F? Violation?	V_F $V_{FO} = V_F$ V_R	- V _R	Actual 6806 6059 747	Exhibit 13-8	7200 7200 2100 ce Area	No No No
V _{FO} Flow Enterin	Actual	Exhibit 13-8	rea		$V_{FO} = V_{F}$ $V_{RO} = V_{RO}$ Flow En	- V _R	Actual 6806 6059 747 g Diver	Exhibit 13-8 Exhibit 13-8 Exhibit 13-10 ge Influence	7200 7200 2100 ce Area	No No No
V _{FO} Flow Enterin V _{R12}	Actual Ig Merge II Actual	Exhibit 13-8 Influence A Max I Exhibit 13-8	rea Desirable		$V_{FO} = V_{F}$ V_{R} Flow En	- V _R	Actual 6806 6059 747 g Diver Actual 113	Exhibit 13-8 Exhibit 13-10 Exhibit 13-10 Exhibit 13-10 Max Desirab Exhibit 13-8	7200 7200 2100 ce Area le 4400:All	No No No Violation?
V _{FO} Flow Enterin V _{R12} Level of Serv	Actual Organical Actual Vice Determination of the control of the	Exhibit 13-8 Influence A Max I Exhibit 13-8 Inination (i	rea Desirable if not F)		$V_{FO} = V_{F}$ $V_{RO} = V_{RO}$ Flow End V_{12} Level of	- V _R	Actual 6806 6059 747 g Diver Actual 113	Exhibit 13-8 Exhibit 13-10 Exhibit 13-10 Exhibit 13-10 Exhibit 13-10 Exhibit 13-8 Exhibit 13-8 Exhibit 13-8	7200 7200 2100 ce Area le 4400:All	No No No Violation?
V _{FO} Flow Enterin V _{R12} Level of Serv D _R = 5.475 + 0	Actual Actual Actual Actual O.00734 v R +	Exhibit 13-8 Influence A Max I Exhibit 13-8 Inination (i	rea Desirable if not F)		$V_{FO} = V_{F}$ $V_{RO} = V_{FO}$ Flow End V_{12} Level of	terin Serv O _R = 4	Actual 6806 6059 747 g Diver Actual 113 vice Det .252 + 0.	Exhibit 13-8 Exhibit 13-10 Exhibit 13-10 Exhibit 13-10 Max Desirab Exhibit 13-8	7200 7200 2100 ce Area le 4400:All	No No No Violation?
V_{FO} Flow Enterin V_{R12} Level of Serv $D_R = 5.475 + 0$ $D_R = (pc/mi/li$	Actual Actual Actual Vice Deteri 0.00734 v R +	Exhibit 13-8 Influence A Max I Exhibit 13-8 Inination (i	rea Desirable if not F)		$V_{FO} = V_{F}$ $V_{RO} = V_{FO}$ $V_{RO} = V_{FO}$ V_{12} $Level of$ $D_{R} = 37$	- V _R terin Serv O _R = 4 6 (pc/	Actual 6806 6059 747 g Diver Actual 113 rice Det 252 + 0.	Exhibit 13-8 Exhibit 13-10 Exhibit 13-10 Exhibit 13-10 Exhibit 13-10 Exhibit 13-8 Exhibit 13-8 Exhibit 13-8	7200 7200 2100 ce Area le 4400:All	No No No Violation?
V_{FO} Flow Enterin V_{R12} Level of Serv $D_R = 5.475 + 0$ $D_R = (pc/mi/line)$ $D_R = (Exhibit)$	Actual Pag Merge II Actual Vice Deteri 0.00734 v R + hn) 13-2)	Exhibit 13-8 Influence A Max I Exhibit 13-8 Inination (i	rea Desirable if not F)		V_F $V_{FO} = V_F$ V_R Flow End V_{12} Level of $D_R = 37$ LOS = E (terin A Serv O _R = 4 .6 (pc/	Actual 6806 6059 747 g Diver Actual 113 vice Det .252 + 0. lmi/ln) bit 13-2)	Exhibit 13-8 Exhibit 13-10 Exhibit 13-10 Exhibit 13-10 Exhibit 13-10 Max Desirab Exhibit 13-8	7200 7200 2100 ce Area le 4400:All	No No No Violation?
V_{FO} Flow Enterin V_{R12} Level of Serve $D_R = 5.475 + 0$ $D_R = (pc/mi/lic)$ LOS = (Exhibit) Speed Deterior	Actual Pag Merge II Actual Actual Actual Actual Actual Actual Actual	Exhibit 13-8 Influence A Max I Exhibit 13-8 Inination (i	rea Desirable if not F)		V_F $V_{FO} = V_F$ V_R Flow End V_{12} Level of $D_R = 37$ $LOS = E O$	terin A Serv O _R = 4 6 (pc/	Actual 6806 6059 747 g Diver Actual 113 vice Det252 + 0. (mi/ln) bit 13-2) minatio	Exhibit 13-8 Exhibit 13-10 Exhibit 13-10 Exhibit 13-10 Exhibit 13-8 Exhibit 13-10 Exhibit 13-8	7200 7200 2100 ce Area le 4400:All	No No No Violation?
V_{FO} Flow Enterin V_{R12} Level of Serve $D_R = 5.475 + 0$ $D_R = (pc/mi/lit)$ LOS = (Exhibit Speed Determine)	Actual	Exhibit 13-8 Influence A Max I Exhibit 13-8 Inination (i	rea Desirable if not F)		V_F $V_{FO} = V_F$ V_R Flow End V_{12} Level of $D_R = 37$ $LOS = E O$ Speed D $D_S = 0.3$	- V _R terin A Serv O _R = 4 .6 (pc/ (Exhib)	Actual 6806 6059 747 g Diver Actual 113 vice Det .252 + 0. vimi/ln) bit 13-2) minatio	Exhibit 13-8 Exhibit 13-10 Exhibit 13-10 Exhibit 13-10 Exhibit 13-10 Max Desirab Exhibit 13-8 Exhibit 13-10 Ex	7200 7200 2100 ce Area le 4400:All	No No No Violation?
V_{FO} Flow Enterin V_{R12} Level of Serve $D_R = 5.475 + 0$ $D_R = (pc/mi/line)$ LOS = (Exhibit 1) Speed Determine $M_S = (Exibit 1)$ $S_R = (Exibit 1)$	Actual Pag Merge II Actual	Exhibit 13-8 Influence A Max I Exhibit 13-8 Inination (i	rea Desirable if not F)		$V_{FO} = V_{F}$ $V_{FO} = V_{F}$ V_{R} Flow End V_{12} Level of $D_{R} = 37$ $LOS = E 0$ $Speed D$ $D_{S} = 0.3$ $S_{R} = 59$	terin A Serv O _R = 4 6 (pc/ (Exhib) Deterin 365 (E:	Actual 6806 6059 747 g Diver Actual 113 vice Det 252 + 0. mi/ln) bit 13-2) minatio chibit 13- (Exhibit	Exhibit 13-8 Exhibit 13-10 Exhibit 13-10 Exhibit 13-10 Exhibit 13-10 Exhibit 13-8 Exhibit 13-10 Ex	7200 7200 2100 ce Area le 4400:All	No No No Violation?
V_{FO} Flow Enterin V_{R12} Level of Serve $D_R = 5.475 + 0$ $D_R = (pc/mi/lit)$ $LOS = (Exhibit)$ Speed Determined $M_S = (Exibit)$	Actual	Exhibit 13-8 Influence A Max I Exhibit 13-8 Inination (i	rea Desirable if not F)		$V_{FO} = V_{F}$ $V_{FO} = V_{F}$ V_{R} Flow End V_{12} Level of $D_{R} = 37$ $LOS = E (0)$ Speed D $D_{S} = 0.3$ $S_{R} = 59$ $S_{0} = 70$	terin Serv Canada Serv Canad	Actual 6806 6059 747 g Diver Actual 113 vice Det .252 + 0. vimi/ln) bit 13-2) minatio	Exhibit 13-8 Exhibit 13-10 Exhibit 13-10 Exhibit 13-10 Exhibit 13-10 Max Desirab Exhibit 13-8 Exhibit 13-10	7200 7200 2100 ce Area le 4400:All	No No No Violation?

	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed	AECOM		Highway/Direction of Travel From/To Jurisdiction	I-95 NB Seg 12-	Bet Off & On Hillsboro
Analysis Time Period	PM		Analysis Year	No-Build	1 2020
Project Description SW 10t	th Street SIMR				
✓ Oper.(LOS))		Des.(N)	Pla	anning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K	5690	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R	0.95 3 0	
Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	General Terrain: Grade % Length Up/Down %	Level mi	
Calculate Flow Adjusti	ments				
fp	1.00		E _R	1.2	
E _T	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
Speed Inputs			Calc Speed Adj and FFS	3	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	3		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			
LOS and Performance	Measures		Design (N)		
Operational (LOS) $v_p = (V \text{ or DDHV}) / (PHF \times N)$ S $D = v_p / S$	x f _{HV} x f _p) 2026 62.1 32.6	pc/h/ln mph pc/mi/ln	Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$	$f_{HV} \times f_p)$	pc/h/ln mph pc/mi/ln
LOS	D		Required Number of Lanes, N		po
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base freedour volume	-	E_R - Exhibits 11-10, 11-12 E_T - Exhibits 11-10, 11-11, 11- f_p - Page 11-18 LOS, S, FFS, v_p - Exhibits 11-		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

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			REEWAY	WEAV	NG WOF	RKSHEE	T		
Genera	l Information	on			Site Info	rmation			
Analyst Agency/Cor Date Perfor Analysis Tir	med	AECO!	М		Freeway/Dir of Travel I-95 NB Weaving Segment Location Seg 13-Bet On & Off Hillsbord Analysis Year No-Build 2020				
Project Des	cription SW 10tl	h Street SIMF	₹		<u> </u>				
Inputs					•				
Weaving se Freeway fre	mber of lanes, N gment length, L _s e-flow speed, FR	S S	- David	790ft 70 mph	Segment typ Freeway min Freeway max Terrain type	imum speed			Freeway 15 2400 Leve
Conver	V (veh/h)	PHF	Truck (%)	RV (%)	T .	Е	ı,	fp	v (no/h)
\/	5060	0.95	3	` ′	E _T	1.2	0.985	1.00	v (pc/h) 5406
V _{FF}	630	0.93	2	0	1.5	1.2	0.983	1.00	692
V _{RF}	630	0.92	2	0	1.5	1.2	0.990	1.00	692
V _{FR} V _{RR}	0	0.95	2	0	1.5	1.2	0.990	1.00	0
V _{NW}	5406	0.00	<u> </u>		1.0	1.2	0.000	V =	6790
V _W	1384								1 0.00
VR	0.204								
Configu	ration Cha	aracteris	tics						
Minimum m	aneuver lanes, I	N _{WL}		2 lc	Minimum we	aving lane c	hanges, LC _{MIN}	I	1384 lc/h
Interchange	e density, ID			0.7 int/mi	Weaving lan	e changes, L	$-C_{W}$		1595 lc/h
Minimum R	F lane changes,	LC_RF		1 lc/pc	Non-weaving	g lane chang	es, LC _{NW}		771 lc/h
Minimum F	R lane changes,	LC_FR		1 lc/pc	Total lane ch	nanges, LC _{AL}	L		2366 lc/h
Minimum R	R lane changes,	LC _{RR}		lc/pc	Non-weaving	g vehicle inde	ex, I _{NW}		299
Weavin	g Segment	Speed,	Density, I	_evel of	·				
•	egment flow rate egment capacity,			6696 veh/h 8315 veh/h	Weaving into	gment speed	, S		0.537 51.7 mph
Ü	egment v/c ratio	_		0.805	Average wea		**		50.8 mph
_	egment density, I	ט	32	2.9 pc/mi/ln					51.9 mph
Level of Se Notes	ivice, LUS			D	Maximum we	eaving length	ı, L _{MAX}		4575 ft

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a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

BASIC F	REEWAY SE	GMENTS WORKSHEET		
		Site Information		
AECOM		Highway/Direction of Travel From/To	I-95 NB Seg 14-l	Bet Off & On Hillsboro
PM		Analysis Year	No-Build	1 2020
h Street SIMR				
		Des.(N)	□Pla	anning Data
5690	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _P	0.95 3 0	
	veh/h	General Terrain: Grade % Length Up/Down %	Level mi	
nents				
1.00		E _R	1.2	
1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
		Calc Speed Adj and FFS	3	
	ft			
	ft	f_LW		mph
3		f_{LC}		mph
	ramps/mi	TRD Adjustment		mph
70.0	mph	FFS	70.0	mph
	mph			
Measures		Design (N)		
x f _{HV} x f _p) 2026 62.1 32.6 D	pc/h/ln mph pc/mi/ln	S D = v _p / S	$f_{HV} \times f_p$)	pc/h/ln mph pc/mi/ln
0 0 1		. actor Ecounom		
D - Density FFS - Free-flow BFFS - Base fre	-	f _p - Page 11-18		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11
	AECOM PM 1 Street SIMR 5690 5690 1.5 3 70.0 Measures (f _{HV} x f _p) 2026 62.1 32.6 D S - Speed D - Density FFS - Free-flow	AECOM PM To Street SIMR 5690 veh/h veh/day veh/h nents 1.00 1.5 ft ft ft 3 ramps/mi mph mph Measures of Hv × fp) 2026 pc/h/ln 62.1 mph 32.6 pc/mi/ln D S - Speed D - Density FFS - Free-flow speed BFFS - Base free-flow speed	## AECOM From/To Jurisdiction of Travel From/To Jurisdiction Analysis Year Des.(N)	Site Information

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		F	REEWAY	WEAV	NG WOR	RKSHEE	T		
Genera	I Information				Site Info				
Analyst Agency/Co Date Perfo Analysis Ti	med	AECON PM	Л		Freeway/Dir Weaving Seg Analysis Yea	gment Locati		IB 5-Bet On & 0 uild 2020	Off to Exp
Project Des	scription SW 10th	n Street SIMR							
Inputs									
Weaving se Freeway fro	umber of lanes, Negment length, L _s ee-flow speed, FF	s FS		4665ft 70 mph	Segment type Freeway min Freeway max Terrain type	imum speed			Freeway 15 2400 Level
Conver	sions to po		1	1	T T	_	1 ,	Ι,	(// //)
.,	V (veh/h)	PHF	Truck (%)	RV (%)	E _T	E _R	f _{HV}	f _p	v (pc/h)
V _{FF}	4665	0.95	3	0	1.5	1.2	0.985	1.00	4984
V_{RF}	575	0.92	2	0	1.5	1.2	0.990	1.00	631
V_{FR}	1025	0.92	2	0	1.5	1.2	0.990	1.00	1125
V_{RR}	65	0.92	2	0	1.5	1.2	0.990	1.00	71
V_{NW}	6740							V =	6811
V_{W}	71								
VR	0.010	<u> </u>							
Config	uration Cha	aracterist	ics		1				
Minimum r	naneuver lanes, l	V_WL		0 lc			hanges, LC _{MIN}		213 lc/h
I -	e density, ID				Weaving land	e changes, L	.C _w		568 lc/h
	RF lane changes,	141		0 lc/pc	Non-weaving	g lane chang	es, LC _{NW}		3192 lc/h
	R lane changes,	111		0 lc/pc	Total lane ch	nanges, LC _{AL}	L		3760 lc/h
Minimum F	RR lane changes,	LC_{RR}		3 lc/pc	Non-weaving	g vehicle inde	ex, I _{NW}		2201
Weavin	g Segment	Speed,	Density, l	_evel of	Service,	and Cap	oacity		
Weaving s	egment flow rate,	V	(6721 veh/h	Weaving inte	•			0.191
Weaving s	egment capacity,	c_{w}	(6831 veh/h	Weaving seg				57.6 mph
· ·	egment v/c ratio			0.984	Average wea		**		61.2 mph
	egment density, [)	39	'	The state of the s				57.6 mph
	ervice, LOS			E	Maximum we	eaving length	ı, L _{MAX}		5824 ft
Notes									

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed	AECOM		Highway/Direction of Travel From/To Jurisdiction	I-95 NB Seg 16-	North of Hillsboro
Analysis Time Period	PM		Analysis Year	No-Build	1 2020
Project Description SW 10t	h Street SIMR				
✓ Oper.(LOS))		Des.(N)	Pla	anning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K	5240	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R	0.95 3 0	
Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	General Terrain: Grade % Length Up/Down %	Level mi	
Calculate Flow Adjustr	ments				
f _p	1.00		E _R	1.2	
E _T	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
Speed Inputs			Calc Speed Adj and FFS	5	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	3		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			
LOS and Performance	Measures		Design (N)		
Operational (LOS) v _p = (V or DDHV) / (PHF x N S D = v _p / S	x f _{HV} x f _p) 1866 64.9 28.8	pc/h/ln mph pc/mi/ln	Design (N) Design LOS v _p = (V or DDHV) / (PHF x N x S D = v _p / S	$f_{HV} \times f_p$)	pc/h/ln mph pc/mi/ln
LOS	D		Required Number of Lanes, N		P • · · · · · · · · · · · · · · · · · ·
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base freedour volume	-	E_R - Exhibits 11-10, 11-12 E_T - Exhibits 11-10, 11-11, 11- f_p - Page 11-18 LOS, S, FFS, v_p - Exhibits 11-2		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

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	BASIC FR	EEWAY SE	GMENTS WORKSHEE	Т	
General Information			Site Information		
Analyst			Highway/Direction of Trave		
Agency or Company	AECOM		From/To	Seg 1-E Palmett	Bet Hillsboro & o
Date Performed Analysis Time Period	AM		Jurisdiction Analysis Year	No-Buil	d 2020
Project Description SW 1	Oth Street SIM	1R			
✓ Oper.(LOS)			es.(N)	Plar	nning Data
Flow Inputs					
Volume, V AADT	4540	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T	0.95 3	
Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	%RVs, P _R General Terrain: Grade % Length Up/Down %	0 Level mi	
Calculate Flow Adjus	tments				
f _p	1.00		E _R	1.2	
E _T	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	1)] 0.985	
Speed Inputs			Calc Speed Adj and	FFS	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	3		f _{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph		70.0	πρπ
LOS and Performanc	e Measures	3	Design (N)		
Operational (LOS) v _p = (V or DDHV) / (PHF x l	N x f _{HV} 1617	pc/h/ln	Design (N) Design LOS v _p = (V or DDHV) / (PHF x	N x f _{HV}	
x f _p)			x f _p)		pc/h/ln
S	68.0	mph	S		mph
$D = v_p / S$	23.8	pc/mi/ln	$D = v_p / S$		pc/mi/ln
LOS	С		Required Number of Lanes	s, N	·
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service speed DDHV - Directional design	BFFS - Ba		E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-3	11-13	f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-1

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			REEWAY	WEAV	NG WOR	RKSHEE	Τ			
Genera	al Information	on			Site Info	rmation				
Analyst Agency/Co Date Perfo Analysis T	rmed	AECON AM	Л		Weaving Seg	Freeway/Dir of Travel I-95 SB Weaving Segment Location Seg 2-Bet On from Exp & Off Analysis Year No-Build 2020				
Project De	scription SW 10tl	h Street SIMF	}							
Inputs					•					
Weaving n Weaving s	onfiguration umber of lanes, N egment length, L _ç ee-flow speed, Ff	S		One-Sided 3 5085ft 70 mph	Segment type Freeway min Freeway max Terrain type	imum speed			Freeway 19 2400 Leve	
Conve	rsions to po	c/h Unde	r Base Co	ndition	S					
	V (veh/h)	PHF	Truck (%)	RV (%)	E _T	ER	f_{HV}	fp	v (pc/h)	
V_{FF}	3440	0.95	3	0	1.5	1.2	0.985	1.00	3675	
V_{RF}	1070	0.92	2	0	1.5	1.2	0.990	1.00	1175	
V_{FR}	1100	0.92	2	0	1.5	1.2	0.990	1.00	1208	
V_RR	120	0.92	2	0	1.5	1.2	0.990	1.00	132	
V_NW	3807							V =	6190	
V_W	2383									
VR	0.385									
Config	uration Cha	aracteris	tics							
Minimum ı	maneuver lanes, I	N_{WL}		2 lc	Minimum we	aving lane c	hanges, LC _{MIN}	I	0 lc/h	
_	ge density, ID			0.7 int/mi	Weaving lan	e changes, L	.C _w		371 lc/h	
	RF lane changes,	IN		0 lc/pc	Non-weaving	g lane chang	es, LC _{NW}		2538 lc/h	
	FR lane changes,	111		0 lc/pc	Total lane ch	nanges, LC _{AL}	L		2909 lc/h	
Minimum I	RR lane changes,	LC _{RR}		lc/pc	Non-weaving	g vehicle inde	ex, I _{NW}		1355	
Weavir	ng Segment	Speed,	Density, I	_evel of	1					
•	segment flow rate		(6111 veh/h	Weaving inte	•			0.145	
	segment capacity,	c_{w}	(6142 veh/h	Weaving seg Average wea				61.2 mph	
•	segment v/c ratio	n	01	0.995	Average non		**		63.0 mph	
•	segment density, I ervice, LOS	J	38	3.7 pc/mi/ln D		• .	1444		60.1 mph	
Notes	CI VICE, LOG			U	Maximum we	eaving length	I, L _{MAX}		6513 ft	

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

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	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed	AECOM		Highway/Direction of Travel From/To Jurisdiction	I-95 SB Seg 3-B	et Off & On Ramp
Analysis Time Period	AM		Analysis Year	No-Buila	1 2020
Project Description SW 10th	h Street SIMR				
✓ Oper.(LOS))		Des.(N)	□Pla	nning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K	4510	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R	0.95 3 0	
Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	General Terrain: Grade % Length Up/Down %	Level mi	
Calculate Flow Adjustr	nents				
f_p	1.00		E _R	1.2	
E _T	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
Speed Inputs			Calc Speed Adj and FFS	3	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_LW		mph
Number of Lanes, N	3		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			
LOS and Performance	Measures		Design (N)		
Operational (LOS) v _p = (V or DDHV) / (PHF x N) S	× f _{HV} × f _p) 1606 68.1	pc/h/ln mph	Design (N) Design LOS v _p = (V or DDHV) / (PHF x N x	$f_{HV} \times f_p$)	pc/h/ln
D = v _p / S	23.6	pc/mi/ln	S		mph
LOS	C	ролили	$D = v_p / S$		pc/mi/ln
			Required Number of Lanes, N		
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base free	-	E_R - Exhibits 11-10, 11-12 E_T - Exhibits 11-10, 11-11, 11- f_p - Page 11-18 LOS, S, FFS, v_p - Exhibits 11-2		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

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	RA	MPS AND	RAMP JUN	CTIONS W	ORKSH	EET				
General Infor				Site Infor						
Analyst			Fr	eeway/Dir of Tr		I-95 S				
Agency or Company	AEC	OM		inction				Hillsboro WB		
Date Performed			Ju	Jurisdiction			Ū			
Analysis Time Perio			Ar	nalysis Year	No-Build 2020					
Project Description	SW 10th Stree	et SIMR								
Inputs									1	
l Upstream Adj Ramp		Freeway Num	ber of Lanes, N	3					Downstre	am Adj
		Ramp Numbe	r of Lanes, N	1					Ramp	•
✓ Yes ☐ Or	า	Acceleration L	ane Length, L₄	950					□Yes	☐ On
☐ No ☑ Of	e t	Deceleration I	ane Length L _D							
□ NO ☑ OI	I	Freeway Volu		4510					✓ No	Off
L _{up} = 2175	ft	Ramp Volume		630					L _{down} =	ft
ар		1	-Flow Speed, S _{FF}	70.0						
$V_{\rm u} = 1220^{-1}$	veh/h	1							V _D =	veh/h
•			ow Speed, S _{FR}	50.0						
Conversion t	o pc/h Un	der Base	Conditions	1	1	_	<u> </u>		1	
(pc/h)	(Veh/hr)	PHF	Terrain	%Truck	%Rv		f_HV	f_p	v = V/PHF	x f _{HV} x f _p
Freeway	4510	0.95	Level	3	0).985	1.00		819
Ramp	630	Level	2	0		0.990	1.00		692	
UpStream	1220	0.92 0.92	Level	2	0	$\overline{}$	0.990	1.00	1	339
DownStream	1220	0.02	LOVOI			+	7.000	1.00	'	000
		Merge Areas						Diverge Areas		
Estimation o					Estimati	ion (of v ₁₂			
	V ₁₂ = V _F	(P)								
l –	.= .		12 6 or 12 7)					$V_R + (V_F - V_F)$		
L _{EQ} = D -			13-6 or 13-7)		L _{EQ} =		(Equation 13	-12 or 13-1	3)
P _{FM} =			ion (Exhibit 13-6)		P _{FD} =		ι	using Equation	on (Exhibit 13	3-7)
V ₁₂ =	2911	•	10.1110		V ₁₂ =		ı	oc/h		
V ₃ or V _{av34}	1908 17)	pc/h (Equati	on 13-14 or 13-		${ m V_3}$ or ${ m V_{av34}}$			pc/h (Equation	13-14 or 13-1	7)
Is V ₃ or V _{av34} > 2,70	,	s VNo				₃₄ > 2,	700 pc/h?	∃Yes □ No		
Is V_3 or $V_{av34} > 1.5$								☐Yes ☐ No		
			on 13-16, 13-		If Yes,V _{12a} =		12 -	oc/h (Equatio	n 13-16, 1	3-18, or
If Yes,V _{12a} =		13-19)	011 10-10, 10-		11 163, V _{12a} –		13	3-19)		
Capacity Che		•			Capacity	y Ch	necks			
	Actual		apacity	LOS F?			Actual	Ca	pacity	LOS F?
					V _F			Exhibit 13-	.8	
V	5511	Exhibit 13-8		No	$V_{FO} = V_{F}$	- V _D		Exhibit 13-	.8	
V _{FO}	3311	EXHIBIT 13-0		INU		K		Exhibit 13		
					V_R			10		
Flow Entering	g Merge In	fluence A	rea		Flow En	terii	ng Dive	rge Influer	nce Area	
	Actual	v .	Desirable	Violation?			Actual	Max Des		Violation?
V _{R12}	3603	Exhibit 13-8	4600:All	No	V ₁₂			Exhibit 13-8		
Level of Serv	rice Deterr	nination (if not F)			Ser	vice De	terminatio	n (if not	<i>F</i>)
	· 0.00734 v _R +							.0086 V ₁₂ - 0	•	-
D _R = 27.3 (pc/n	• • •	12	,,		1	c/mi/		12	J	
LOS = C (Exhibit	•						it 13-2)			
` ` `	,							<u> </u>		
	peed Determination						rminatio	<i>/</i> //		
$M_{S} = 0.369 (Exi$	S = 0.369 (Exibit 13-11)						13-12)			
S _R = 59.7 mph	(Exhibit 13-11)				S _R = mph (Exhibit 13-12)					
$S_0 = 64.9 \text{ mph}$	(Exhibit 13-11)				S ₀ = mph (Exhibit 13-12)					
	(Exhibit 13-13)				S = m _l	ph (Ex	khibit 13-13)			
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	BASIC	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst			Highway/Direction of Travel	195/SB	
Agency or Company	AECOM		From/To	Seg 5-B	et WB On & EB On
Date Performed	7.200		Jurisdiction	Ramps	
Analysis Time Period	AM		Analysis Year	No-Buila	1 2020
Project Description SW 10th	Street SIMR				
✓ Oper.(LOS)			Des.(N)	□Pla	nning Data
Flow Inputs					
Volume, V	5140	veh/h	Peak-Hour Factor, PHF	0.95	
AADT		veh/day	%Trucks and Buses, P _T	3	
Peak-Hr Prop. of AADT, K			%RVs, P _R	0	
Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	General Terrain: Grade % Length	Level mi	
DDIIV - AADI X K X D		Veriirii	Up/Down %	1111	
Calculate Flow Adjustm	nents		· · · · · · · · · · · · · · · · · · ·		
f _p	1.00		E _R	1.2	
'p E _T	1.5			0.985	
	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$		
Speed Inputs			Calc Speed Adj and FFS	5	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	3		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			
LOS and Performance I	Measures		Design (N)		
			Design (N)		
Operational (LOS)			Design LOS		
v _p = (V or DDHV) / (PHF x N x	(f _{HV} x f _p) 1831	pc/h/ln	$v_p = (V \text{ or DDHV}) / (PHF x N x)$	fxf)	pc/h/ln
S	65.4	mph	S	нү - тр/	mph
$D = v_p / S$	28.0	pc/mi/ln	D = v _p / S		pc/mi/ln
LOS	D		Required Number of Lanes, N		ролили
Glossam			Factor Location		
Glossary	0 0 :		i actor Location		
N - Number of lanes	S - Speed		E _R - Exhibits 11-10, 11-12		f _{I W} - Exhibit 11-8
V - Hourly volume	D - Density		E _T - Exhibits 11-10, 11-11, 11-	-13	f _{I C} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow	-	f _n - Page 11-18		TRD - Page 11-1
LOS - Level of service	BFFS - Base fr	ee-flow speed	LOS, S, FFS, v _p - Exhibits 11-	2, 11-3	J
DDHV - Directional design ho	ur volume		۲		

			REEWAY	WEAV	NG WOR	KSHEE	T		
Genera	al Information	on			Site Info	rmation			
Analyst Agency/Co Date Perfo Analysis T		AECOI AM	М		Freeway/Dir Weaving Seg Analysis Yea	ment Locati		SB S- Bet Hillsbor uild 2020	o & 10th St
Project De	scription SW 10tl	h Street SIMF	₹						
Inputs					1				
Weaving n Weaving s Freeway fr	onfiguration number of lanes, N egment length, L _s ee-flow speed, FF	S S		1830ft 70 mph	Segment type Freeway min Freeway max Terrain type	imum speed			Freeway 15 2400 Leve
Conve	rsions to po	1		1		F		1 4	(n.a/la)
\/	V (veh/h)	PHF	Truck (%)	RV (%)	E _T	E _R	f _{HV}	fp	v (pc/h)
V _{FF}	3960	0.95	3	0	1.5	1.2	0.985	1.00	4231
V _{RF}	740	0.92	2	0	1.5	1.2	0.990	1.00	812
V _{FR}	1180	0.92	2	0	1.5	1.2	0.990	1.00	1295
V _{RR}	0	0.95	0	0	1.5	1.2	1.000	1.00	0
V _{NW}	4231							V =	6338
V _W	2107								
VR Config	0.332 uration Cha	ractoric	tice						
			ucs	0.1-	Minimum we	aving lane c	hanges, LC _{MIN}		812 lc/h
	maneuver lanes, I ge density, ID	Y WL		2 lc 0.7 int/mi	Weaving lan	-	- 14111	N	1185 lc/h
	RF lane changes,	I C			Non-weaving		••		1093 lc/h
	FR lane changes,	141		0 lc/pc	Total lane ch				2278 lc/h
	RR lane changes,	111		·	Non-weaving	,	_		542
	ng Segment		Density I						042
	segment flow rate	•		6256 veh/h	Weaving inte				0.269
Ŭ	segment capacity,			7113 veh/h	Weaving seg	-			57.1 mph
	segment v/c ratio	W		0.879	Average wea	aving speed,	S_W		58.4 mph
•	segment density, I	D	27	7.7 pc/mi/ln					56.5 mph
Level of S	ervice, LOS			С	Maximum weaving length, L _{MAX} 5934 t				
Notes									

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

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	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed	AECOM		Highway/Direction of Travel From/To Jurisdiction	I-95 SB Seg 7-B	et Off & On Ramp
Analysis Time Period	AM		Analysis Year	No-Build	d 2020
Project Description SW 10t	h Street SIMR				
✓ Oper.(LOS))		Des.(N)	Pla	anning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K	4700	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R	0.95 3 0	
Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	General Terrain: Grade % Length Up/Down %	Level mi	
Calculate Flow Adjustr	ments				
f_p	1.00		E _R	1.2	
É _T	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
Speed Inputs			Calc Speed Adj and FFS	3	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_LW		mph
Number of Lanes, N	3		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			
LOS and Performance	Measures		Design (N)		
Operational (LOS) v _p = (V or DDHV) / (PHF x N	r	pc/h/ln	Design (N) Design LOS v _D = (V or DDHV) / (PHF x N x	$f_{HV} \times f_{p}$	pc/h/ln
S	67.4	mph	S	р	mph
D = v _p / S	24.8	pc/mi/ln	$D = v_p / S$		pc/mi/ln
LOS	С		Required Number of Lanes, N		
Glossary			Factor Location		
N - Number of lanes	S - Speed		E E I II II 44 40 44 40		
V - Hourly volume	D - Density		E _R - Exhibits 11-10, 11-12	40	f _{LW} - Exhibit 11-8
v _p - Flow rate	FFS - Free-flow	speed	E _T - Exhibits 11-10, 11-11, 11-	13	f _{LC} - Exhibit 11-9
LOS - Level of service	BFFS - Base from	ee-flow speed	f _p - Page 11-18	0 44 0	TRD - Page 11-11
DDHV - Directional design ho	our volume		LOS, S, FFS, v _p - Exhibits 11-2	∠, 11-3	

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	RA	MPS AND	RAMP JUN	CTIONS W	ORKSH	EET				
General Infor				Site Infor						
Analyst			Fr	eeway/Dir of Tr		I-95 S	B			
Agency or Company	AEC	OM		inction			- -Merge from	10th St		
Date Performed				risdiction		5 -				
Analysis Time Perio	d AM		Ar	nalysis Year		No-Bu	uild 2020			
Project Description	I-95 AT HILLS	BORO BOULE	VARD IMR							
Inputs										
l Upstream Adj Ramp	ı	Freeway Num	ber of Lanes, N	3					Downstre	am Adi
		Ramp Numbe	r of Lanes, N	1					Ramp	
✓ Yes ☐ Or	า	Acceleration L	ane Length, L _A	1470					□Yes	☐ On
	••		ane Length L _D							
□ No ☑ Of	T	Freeway Volu		4700					✓ No	Off
L _{up} = 2210	ft	1	•						L _{down} =	ft
-up 2210		Ramp Volume		1220					down	
$V_{u} = 1180^{-1}$	veh/h		-Flow Speed, S _{FF}	70.0					$V_D =$	veh/h
-			ow Speed, S _{FR}	50.0						
Conversion t	o pc/h Un	der 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	(ven/nr) 4700	0.95	Level	3	0	+,).985	1.00	+	5022
Ramp	1220	0.95	Level	2	0	_	0.900	1.00		339
UpStream	1180	0.92	Level	2	0	_	0.990	1.00	+	295
DownStream	1100	0.92	Level		U	+	0.990	1.00		293
Downotream		Merge Areas						Diverge Areas		
Estimation of		g			Estimati	ion	of V ₄₂	<u>g</u>		
		/ D \					12			
	V ₁₂ = V _F		10.0 10.7)				$V_{12} = Y_{12}$	V _R + (V _F - V _F	$_{R})P_{FD}$	
L _{EQ} =			13-6 or 13-7)		L _{EQ} =		((Equation 13	-12 or 13-1	3)
P _{FM} =			ion (Exhibit 13-6)		P _{FD} =		ι	using Equation	on (Exhibit 1	3-7)
V ₁₂ =	3101	•			V ₁₂ =		ŗ	oc/h		
V ₃ or V _{av34}		pc/h (Equati	on 13-14 or 13-		V ₃ or V _{av34}			pc/h (Equation	13-14 or 13-1	7)
Is V ₃ or V _{av34} > 2,70	17)	a Z Na				₂₄ > 2.		∐Yes		,
								∃Yes □ No		
Is V_3 or $V_{av34} > 1.5$			10 10 10				- 112- L	oc/h (Equatio	, on 13-16. 1	3-18. or
If Yes,V _{12a} =		pc/n (Equati 13-19)	on 13-16, 13-		If Yes,V _{12a} =	=		3-19)		- 12, -1
Capacity Che		10 10)			Capacit	v Cł	necks			
Supusity Sile	Actual		apacity	LOS F?	Capacity	,	Actual	Ca	apacity	LOS F?
	7 totaai		apaony	2001.	V _F		7 totaai	Exhibit 13	1	20011
						\/		Exhibit 13		
V_{FO}	6361	Exhibit 13-8		No	$V_{FO} = V_{F}$	- v _R		Exhibit 13		_
					V_R			10) ⁻	
Flow Entering	a Merae Ir	ifluence 4	rea	1	Flow Fn	teri	na Dive	rge Influei	nce Area	1
o Lincilli	Actual	- O	Desirable	Violation?		T	Actual	Max Des		Violation?
V _{R12}	4440	Exhibit 13-8	4600:All	No	V ₁₂	\top		Exhibit 13-8	1	
Level of Serv				1		F Sei	vice De	terminatio	on (if not	F)
	· 0.00734 v _R +							.0086 V ₁₂ - 0	•	• /
• • • • • • • • • • • • • • • • • • • •	• •	0.3070 v ₁₂ - 0.9	55521 L _A		L			.0000 v ₁₂ - 0	L _D	
$D_{R} = 30.3 (\text{pc/m})$,					c/mi/	•			
LOS = D (Exhibit					`		it 13-2)			
Speed Deterr	mination				Speed D			on		
M _S = 0.505 (Exi	ibit 13-11)				$D_s = (E$	xhibit	13-12)			
· ·	(Exhibit 13-11)				S _R = m _l	ph (Ex	hibit 13-12)			
	(Exhibit 13-11)					ph (Ex	hibit 13-12)			
•	(Exhibit 13-13)						hibit 13-13)			
·	of Florido, All Dia				<u> </u>	. \-'				d: E/21/2010

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	BASIC I	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed	AECOM		Highway/Direction of Travel From/To Jurisdiction	I-95 SB Seg 9-B	et 10th & Exit to Exp
Analysis Time Period	AM		Analysis Year	No-Build	d 2020
Project Description SW 10	th Street SIMR				
✓ Oper.(LOS)		Des.(N)	□Pla	anning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K	5920	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R	0.95 3 0	
Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	General Terrain: Grade % Length Up/Down %	Level mi	
Calculate Flow Adjust	ments				
f_p	1.00		E _R	1.2	
E _T	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
Speed Inputs			Calc Speed Adj and FFS	3	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	3		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS	3	mph			
LOS and Performance	Measures		Design (N)		
<u>Operational (LOS)</u> v _p = (V or DDHV) / (PHF x N	x f _{HV} x f _p) 2108	pc/h/ln	Design (N) Design LOS $v_n = (V \text{ or DDHV}) / (PHF \times N \times N)$	f vf)	20/2/12
S	60.4	mph		'HV ^ 'p/	pc/h/ln
$D = v_p / S$	34.9	pc/mi/ln	S D = v _p / S		mph pc/mi/ln
LOS	D		Required Number of Lanes, N		ρο/πι/π
Glossary			Factor Location		
N - Number of lanes	S - Speed				
V - Hourly volume	D - Density		E _R - Exhibits 11-10, 11-12		f _{LW} - Exhibit 11-8
v _p - Flow rate	FFS - Free-flow	speed	E _T - Exhibits 11-10, 11-11, 11-	-13	f _{LC} - Exhibit 11-9
LOS - Level of service	BFFS - Base fr	-	f _p - Page 11-18		TRD - Page 11-1
DDHV - Directional design h		se-now specu	LOS, S, FFS, v _p - Exhibits 11-	2, 11-3	
וועכ - אוועכווטווא - אווער	oui voiuitie				

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	<u> </u>	RAMPS	S AND RAMI			RKS	HEET			
	formation			Site Infor						
Analyst	. = .			eeway/Dir of Tr		I-95 SE		_		
Agency or Compa Date Performed	any AEC	ЮМ		nction risdiction	;	Seg 10	- Diverge to	Express		
Analysis Time Pe	eriod AM			alysis Year	ı	No-Bui	ld 2020			
<u> </u>	on SW 10th Stree	et SIMR	7.1.	aryolo roar	<u> </u>	I TO Dan	14 2020			
nputs										
Upstream A	di Ramp	Freeway Numb	er of Lanes, N	3					Downstre	am Adi
•		Ramp Number	of Lanes, N	1					Ramp	ann 7 taj
✓ Yes	☑ On	Acceleration La	ane Length, L _∆						Yes	☐ On
□No	Off	Deceleration La	ane Length L _D	300						
		Freeway Volum	ne, V _F	5920					✓ No	Off
L _{up} =	6000 ft	Ramp Volume,	V _D	860					L _{down} =	ft
			Flow Speed, S _{FF}	70.0					\	
$V_{u} =$	1220 veh/h	Ramp Free-Flo		45.0					$V_D =$	veh/h
Conversion	n to pc/h Un		- 111	10.0						
	<i>1 to pen on ∀</i>			0/ T	0/ D		<u>,</u>	f	. - \//DUI	= v f v f
(pc/h)	(Veh/hr)	PHF	Terrain	%Truck	%Rv	_	f _{HV}			x f _{HV} x f _p
Freeway	5920	0.95	Level	3	0	0.	985	1.00		325
Ramp	860	0.92	Level	2	0	0.	990	1.00	(944
UpStream	1220	0.92	Level	2	0	0.	990	1.00	1	339
DownStream										
Ectimation	of v	Merge Areas			Ectimati	iono		iverge Areas		
Stimation					Estimati	on o				
	$V_{12} = V_{F}$	₋ (P _{FM})					V ₁₂ =	$V_R + (V_F - V_R)$)P _{FD}	
- _{EQ} =	(Equ	ation 13-6 or 1	13-7)		L _{EQ} =		92	51.65 (Equation	on 13-12	or 13-13)
P _{FM} =	usinç	g Equation (E	xhibit 13-6)		P _{FD} =		0.5	558 using Equ	ation (Exh	nibit 13-7)
′ ₁₂ =	pc/h				V ₁₂ =		394	49 pc/h		
or V _{av34}	pc/h	(Equation 13-	14 or 13-17)		V ₃ or V _{av34}		23	76 pc/h (Equa	ation 13-1	4 or 13-17)
	2,700 pc/h? ☐ Y ∈					, > 2,7		Yes ☑ No		,
	1.5 * V ₁₂ /2							Yes ☑ No		
3 av34	· -		16, 13-18, or		If Yes,V _{12a} =			c/h (Equation	13-16, 13	3-18, or 13-
V00 V -	pc/11	(Equation 13-			III TES V.a -		19		•	
.24	13-19				-			')		
	13-19 hecks	9)		1	Capacity	y Ch	ecks			1,00.50
	13-19	9)	apacity	LOS F?	Capacity	y Ch	e cks Actual	Ca	pacity	LOS F?
Capacity C	13-19 hecks	Ca		LOS F?	Capacity V _F		Actual 6325	Ca _l Exhibit 13-8	7200	LOS F?
.24	13-19 hecks	9)		LOS F?	Capacity		e cks Actual	Ca	7200	
Capacity C	13-19 hecks	Ca		LOS F?	Capacity V _F		Actual 6325	Ca _l Exhibit 13-8	7200 7200	No
Capacity C	13-19 hecks	Ca	apacity	LOS F?	$\begin{array}{c c} \textbf{Capacity} \\ & \textbf{V}_{F} \\ \hline \textbf{V}_{FO} = \textbf{V}_{F} \\ & \textbf{V}_{R} \\ \end{array}$	- V _R	Actual 6325 5381 944	Cal Exhibit 13-8 Exhibit 13-8	7200 7200 2100	No No No
Capacity C	13-19 hecks Actual	Exhibit 13-8	apacity	LOS F? Violation?	$\begin{array}{c c} \textbf{Capacity} \\ & \textbf{V}_{F} \\ \hline \textbf{V}_{FO} = \textbf{V}_{F} \\ & \textbf{V}_{R} \\ \end{array}$	- V _R	Actual 6325 5381 944	Cal Exhibit 13-8 Exhibit 13-8 Exhibit 13-10	7200 7200 2100 ce Area	No No No
Capacity C	13-19 hecks Actual hing Merge II	Exhibit 13-8	apacity rea		$\begin{array}{c c} \textbf{Capacity} \\ & \textbf{V}_{F} \\ \hline \textbf{V}_{FO} = \textbf{V}_{F} \\ & \textbf{V}_{R} \\ \end{array}$	- V _R	Actual 6325 5381 944 g Diver	Exhibit 13-8 Exhibit 13-10 Exhibit 13-10	7200 7200 2100 ce Area	No No No
V _{FO}	13-19 hecks Actual hing Merge II	Exhibit 13-8 Exhibit 13-8 Max D Exhibit 13-8	apacity rea Desirable		Capacity V_{F} $V_{FO} = V_{F}$ V_{R} Flow En	- V _R	Actual 6325 5381 944 g Diver Actual 8949	Exhibit 13-8 Exhibit 13-8 Exhibit 13-10 Exhibit 13-10 Exhibit 13-10 Exhibit 13-10	7200 7200 2100 ce <i>Area</i> le 4400:All	No No No Violation?
Capacity C V _{FO} Flow Enter V _{R12} Level of Se	Actual Actual Actual	Exhibit 13-8 Max D Exhibit 13-8 Exhibit 13-8	rea Desirable f not F)		V _{FO} = V _F V _R Flow En V ₁₂ Level of	terin	Actual 6325 5381 944 g Diver Actual 8949 vice Det	Exhibit 13-8 Exhibit 13-8 Exhibit 13-10 ge Influence Max Desirab Exhibit 13-8	7200 7200 2100 ce Area le 4400:All	No No No Violation?
Capacity C V_{FO} Flow Enter V_{R12} Level of Set D _R = 5.475 +	Actual Actual Actual Actual Prvice Determine to 0.00734 v R +	Exhibit 13-8 Max D Exhibit 13-8 Exhibit 13-8	rea Desirable f not F)		V _F V _{FO} = V _F V _R Flow En V ₁₂ Level of	terin	Actual 6325 5381 944 g Diver Actual 8949 vice Det	Exhibit 13-8 Exhibit 13-10 Exhibit 13-10 Exhibit 13-10 Exhibit 13-10 Exhibit 13-8 Exhibit 13-8 Exhibit 13-8	7200 7200 2100 ce Area le 4400:All	No No No Violation?
Capacity C V_{FO} Flow Enter V_{R12} Level of Se $D_R = 5.475 + 0$ $C_R = 0$ $C_R = 0$	Actual ing Merge II Actual ervice Deteri	Exhibit 13-8 Max D Exhibit 13-8 Exhibit 13-8	rea Desirable f not F)		Capacity $V_{FO} = V_{F}$ V_{R} Flow En V_{12} Level of $D_{R} = 37$	- V _R terin Serv D _R = 4 2.2 (pc)	Actual 6325 5381 944 g Diver Actual 3949 vice Det 1.252 + 0.4 /mi/ln)	Exhibit 13-8 Exhibit 13-10 Exhibit 13-10 Exhibit 13-10 Exhibit 13-10 Exhibit 13-8 Exhibit 13-8 Exhibit 13-8	7200 7200 2100 ce Area le 4400:All	No No No Violation?
Capacity C V_{FO} Flow Enter V_{R12} Level of Se $D_R = 5.475 + 0$ $C_R = (pc/m)$ $C_R = (Exhilication of Section of Sec$	ing Merge II Actual	Exhibit 13-8 Max D Exhibit 13-8 Exhibit 13-8	rea Desirable f not F)		$Capacity$ V_F $V_{FO} = V_F$ V_R $Flow En$ V_{12} $Level of$ $D_R = 37$ $LOS = E$	terin Serv O _R = 4 2.2 (pc. (Exhib	Actual 6325 5381 944 g Diver Actual 8949 vice Det 1.252 + 0. /mi/ln) bit 13-2)	Exhibit 13-8 Exhibit 13-8 Exhibit 13-10 Ge Influence Max Desirab Exhibit 13-8 Exhibit 13-8 Exhibit 13-8 Etermination 0086 V ₁₂ - 0.0	7200 7200 2100 ce Area le 4400:All	No No No Violation?
Capacity C V_{FO} Flow Enter V_{R12} Level of Se $D_R = 5.475 + 0$ $D_R = (pc/m)$ $D_R = (Exhilication of Speed Determine)$	ing Merge II Actual	Exhibit 13-8 Max D Exhibit 13-8 Exhibit 13-8	rea Desirable f not F)		Capacity $V_{FO} = V_{F}$ $V_{RO} = V_{RO}$ Flow En V_{12} Level of $D_{R} = 37$ $LOS = E$ Speed D	terin	Actual 6325 5381 944 g Diver Actual 3949 vice Det 1.252 + 0. /mi/ln) bit 13-2) minatio	Exhibit 13-8 Exhibit 13-10 Exhibit 13-10 Exhibit 13-10 Exhibit 13-10 Exhibit 13-8	7200 7200 2100 ce Area le 4400:All	No No No Violation?
Flow Enter V_{R12} Level of Se $D_R = 5.475 + 6$ $D_R = (pc/m)$ $COS = (Exhilt Speed Determinent Mag = (Exibit Mag = (Exhilt Speed Determinent Mag = (Exh$	Actual ing Merge II Actual ervice Determination bit 13-2) ermination it 13-11)	Exhibit 13-8 Max D Exhibit 13-8 Exhibit 13-8	rea Desirable f not F)		Capacity $V_{FO} = V_{F}$ $V_{FO} = V_{F}$ V_{R} Flow En V_{12} Level of $D_{R} = 37$ $LOS = E$ Speed D $D_{S} = 0.3$	- V _R terin Serv D _R = 4 2.2 (pc) (Exhib) Deterion 383 (E	Actual 6325 5381 944 944 19 Diver 19 Actual 19 Actual 19 Actual 19 Actual 19 Actual 19 Dit 13 - 2) 19 Initiatio 19 Actual 10	Exhibit 13-8 Exhibit 13-8 Exhibit 13-10 Ge Influence Max Desirab Exhibit 13-8 Exhibit 13-8 Exermination 0086 V ₁₂ - 0.0	7200 7200 2100 ce Area le 4400:All	No No No Violation?
Capacity C V_{FO} Flow Enter V_{R12} Level of Se $D_R = 5.475 + 0$ $D_R = (pc/m)$ $D_R = (Exhilt)$ Speed Determined to the second	Actual Actual	Exhibit 13-8 Max D Exhibit 13-8 Exhibit 13-8	rea Desirable f not F)		Capacity $V_{FO} = V_{F}$ $V_{RO} = V_{FO}$ $V_{RO} = V_{FO}$ Flow En V_{12} Level of $D_{R} = 37$ $LOS = E$ $Speed D$ $D_{S} = 0.3$ $S_{R} = 59$	terin Serv D _R = 4 2.2 (pc. (Exhibit 383 (E	Actual 6325 5381 944 g Diver Actual 8949 Vice Det 1.252 + 0.0 /mi/ln) bit 13-2) minatio xhibit 13-1	Exhibit 13-8 Exhibit 13-10 Ge Influence Max Desirab Exhibit 13-8 Exhi	7200 7200 2100 ce Area le 4400:All	No No No Violation?
Capacity C V _{FO} Flow Enter V _{R12} Level of Se D _R = 5.475 + O _R = (pc/m) OS = (Exhilt Speed Deter M_S = (Exibit M_S = mph (Exibit M_S = mph (Exibit)	Actual ing Merge II Actual ervice Determination bit 13-2) ermination it 13-11)	Exhibit 13-8 Max D Exhibit 13-8 Exhibit 13-8	rea Desirable f not F)		Capacity V_F $V_{FO} = V_F$ V_R Flow En V_{12} Level of $D_R = 37$ $LOS = E$ $Speed D$ $D_s = 0.3$ $S_R = 59$ $S_0 = 72$	- V _R terin Serv D _R = 4 2.2 (pc) (Exhibit Deterin 383 (E 3.3 mph 3.2 mph	Actual 6325 5381 944 944 19 Diver 19 Actual 19 Actual 19 Actual 19 Actual 19 Actual 19 Dit 13 - 2) 19 Initiatio 19 Actual 10	Exhibit 13-8 Exhibit 13-8 Exhibit 13-10 ge Influence Max Desirab Exhibit 13-8 Exhibit 13-8 Exhibit 13-8 Exermination 0086 V ₁₂ - 0.0 12) 13-12) 13-12)	7200 7200 2100 ce Area le 4400:All	No No No Violation?

	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed	AECOM		Highway/Direction of Travel From/To Jurisdiction	-	Bet Off Exp Off Sample
Analysis Time Period	AM		Analysis Year	No-Build	2020
Project Description SW 10th			Doc (NI)	□ Dia	naina Data
✓ Oper.(LOS)			Des.(N)	∟Pia	nning Data
Flow Inputs					
Volume, V AADT	5060	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T	0.95 3	
Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	%RVs, P _R General Terrain: Grade % Length Up/Down %	0 Level mi	
Calculate Flow Adjustr	nents				
f _p E _T	1.00 1.5		E_R $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	1.2 0.985	
Speed Inputs			Calc Speed Adj and FFS		
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_LW		mph
Number of Lanes, N	3		f _{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph		. •.•	
LOS and Performance	Measures		Design (N)		
Operational (LOS) v _p = (V or DDHV) / (PHF x N : S D = v _p / S LOS	x f _{HV} x f _p) 1802 65.8 27.4 D	pc/h/ln mph pc/mi/ln	Design (N) Design LOS v _p = (V or DDHV) / (PHF x N x S D = v _p / S Required Number of Lanes, N	·	pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base freeur volume	-	E_R - Exhibits 11-10, 11-12 E_T - Exhibits 11-10, 11-11, 11- f_p - Page 11-18 LOS, S, FFS, v_p - Exhibits 11-		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

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^~~~! !~· ſ		RAMPS	S AND RAM			RKS	HEET			
General Info	ormation			Site Infor		. 05 05				
Analyst	450	2014		eeway/Dir of Tr		I-95 SE		0 l. D.l		
Agency or Compa Date Performed	any AEC	JOINI		nction risdiction	,	Seg 12	- Diverge to	Sample Rd		
Analysis Time Per	riod AM			alysis Year	i	No-Bui	ld 2020			
	n SW 10th Stree	et SIMR		,						
Inputs										
Upstream Ad	i Ramp	Freeway Numb	er of Lanes, N	3					Downstre	am Adi
·		Ramp Number	of Lanes, N	1					Ramp	,
✓ Yes	On	Acceleration La	ane Length, L _A						☐Yes	On
□No	✓ Off	Deceleration La	ane Length L _D	250						
	_ 0	Freeway Volum	ne, V _F	5060					✓ No	Off
L _{up} =	2000 ft	Ramp Volume,	V_R	880					L _{down} =	ft
		Freeway Free-	Flow Speed, S _{FF}	70.0				,	\/ -	voh/h
$V_u =$	860 veh/h	Ramp Free-Flo		45.0					V _D =	veh/h
Conversion	to pc/h Un		111							
	V	PHF		%Truck	%Rv		_f T	f	/ = \//PHE	x f _{HV} x f _p
(pc/h)	(Veh/hr)		Terrain			_	f _{HV}			· ·
Freeway	5060	0.95	Level	3	0	_	985	1.00		106
Ramp	880	0.92	Level	2	0		990	1.00		66
UpStream	860	0.92	Level	2	0	0.	990	1.00	9	44
DownStream		Manna Anasa			-					
Stimation	of v	Merge Areas			Estimati	ion o		verge Areas		
_Sumation					LSuman	011 0	·-			
	$V_{12} = V_{F}$	• • • • • • • • • • • • • • • • • • • •						$V_R + (V_F - V_R)$		
- _{EQ} =	(Equ	ation 13-6 or 1	13-7)		L _{EQ} =		(E	quation 13-12	2 or 13-13	3)
P _{FM} =	using	g Equation (Ex	xhibit 13-6)		P _{FD} =		0.58	30 using Equ	ation (Exh	ibit 13-7)
/ ₁₂ =	pc/h				V ₁₂ =		354	3 pc/h		
V_3 or V_{av34}	pc/h	(Equation 13-	14 or 13-17)		$\rm V_3$ or $\rm V_{av34}$		186	3 pc/h (Equa	ation 13-1	4 or 13-17)
	,700 pc/h?	es 🗌 No				₃₄ > 2,7	00 pc/h? 🔲	Yes 🗹 No		
	.5 * V ₁₂ /2							Yes ☑ No		
f Yes,V _{12a} =	pc/h	(Equation 13-	16, 13-18, or		If Yes,V _{12a} =			/h (Equation	13-16, 13	-18, or 13-
.24	13-19	1)			· ·		19))		
Capacity Cl		1 0		1 100 50	Capacity	Che		1 0-	11	1,00,50
	Actual	l Ca	pacity	LOS F?			Actual	<u> </u>	pacity 7000	LOS F?
					1//					
.,					V _F	, 	5406	Exhibit 13-8	+	No
V_{FO}		Exhibit 13-8			$V_{FO} = V_{F}$	- V _R	4440	Exhibit 13-8	7200	No No
V _{FO}						- V _R		_	7200	
	ing Merge li	Exhibit 13-8			$V_{FO} = V_{F}$ V_{R}		4440 966	Exhibit 13-8 Exhibit 13-10 ge Influence	7200 2100 ce <i>Area</i>	No No
Flow Enteri	i ng Merge II Actual	Exhibit 13-8 nfluence Ai Max D	rea Jesirable	Violation?	$V_{FO} = V_F$ V_R Flow En	terin	4440 966	Exhibit 13-8 Exhibit 13-10 ge Influence Max Desirab	7200 2100 ce <i>Area</i> le	No
		Exhibit 13-8		Violation?	$V_{FO} = V_{F}$ V_{R}	terin	4440 966 g Diver g	Exhibit 13-8 Exhibit 13-10 ge Influence	7200 2100 ce <i>Area</i>	No No
Flow Enteri		Exhibit 13-8 nfluence Ai Max D Exhibit 13-8)esirable	Violation?	$V_{FO} = V_F$ V_R Flow En V_{12}	terin	4440 966 g Diver Actual	Exhibit 13-8 Exhibit 13-10 ge Influence Max Desirab	7200 2100 2100 ce Area le 4400:All	No No Violation?
V _{R12} Level of Se	Actual	Exhibit 13-8 Influence AI Max D Exhibit 13-8 Influence AI Max D Exhibit 13-8	esirable f not F)	Violation?	V _{FO} = V _F V _R Flow En V ₁₂ Level of	terin	4440 966 g Divero Actual 3543	Exhibit 13-8 Exhibit 13-10 ge Influence Max Desirab Exhibit 13-8	7200 2100 2100 Ce Area le 4400:All	No No Violation?
V _{R12} -evel of Sel D _R = 5.475 +	Actual rvice Deteri 0.00734 v _R +	Exhibit 13-8 Influence AI Max D Exhibit 13-8 Influence AI Max D Exhibit 13-8	esirable f not F)	Violation?	V _{FO} = V _F V _R Flow En V ₁₂ Level of	terin	4440 966 g Divero Actual 3543	Exhibit 13-8 Exhibit 13-10 ge Influence Max Desirable Exhibit 13-8 Ermination	7200 2100 2100 Ce Area le 4400:All	No No Violation?
Flow Enterion V_{R12} Level of Selucion $D_R = 5.475 + 0$ $D_R = (pc/mi.)$	Actual rvice Deteri 0.00734 v _R +	Exhibit 13-8 Influence AI Max D Exhibit 13-8 Influence AI Max D Exhibit 13-8	esirable f not F)	Violation?	$V_{FO} = V_{F}$ V_{R} Flow En V_{12} Level of $D_{R} = 34$	terin Serv O _R = 4 .0 (pc.	4440 966 g Diverg Actual 3543 vice Det 4.252 + 0.00 (mi/ln)	Exhibit 13-8 Exhibit 13-10 ge Influence Max Desirable Exhibit 13-8 Ermination	7200 2100 2100 Ce Area le 4400:All	No No Violation?
Flow Enterion V_{R12} Level of Selection $D_R = 5.475 + 0$ $Q_R = (pc/mi.)$ $Q_R = (Exhib)$	Actual rvice Deteri 0.00734 v _R + //In) bit 13-2)	Exhibit 13-8 Influence AI Max D Exhibit 13-8 Influence AI Max D Exhibit 13-8	esirable f not F)	Violation?	$V_{FO} = V_{F}$ V_{R} Flow En V_{12} Level of $D_{R} = 34$ LOS = D	terin Serv O _R = 4 .0 (pc.	4440 966 g Diver Actual 3543 vice Det 1.252 + 0.0 (mi/ln) bit 13-2)	Exhibit 13-8 Exhibit 13-10 ge Influence Max Desirab Exhibit 13-8 Exhibit 13-8 Exhibit 13-8 Exhibit 13-8 Exhibit 13-8	7200 2100 2100 Ce Area le 4400:All	No No Violation?
V _{R12} Level of Sel D _R = 5.475 + D _R = (pc/mi. OS = (Exhib	Actual rvice Determination Actual Actual	Exhibit 13-8 Influence AI Max D Exhibit 13-8 Influence AI Max D Exhibit 13-8	esirable f not F)	Violation?	$V_{FO} = V_F$ V_R Flow En V_{12} Level of $D_R = 34$ $LOS = D$ Speed D	terin Serv O _R = 4 .0 (pc. (Exhibit)	4440 966 g Diverg Actual 8543 vice Det (mi/ln) bit 13-2) mination	Exhibit 13-8 Exhibit 13-10 ge Influence Max Desirable Exhibit 13-8 ermination 0086 V ₁₂ - 0.0	7200 2100 2100 Ce Area le 4400:All	No No Violation?
Flow Enterion V_{R12} Level of Sea $D_R = 5.475 + D_R = (pc/mi. OS = (Exhib) $ Speed Deteining the speed of the speed $M_S = (Exhib) $	Actual rvice Deterion 0.00734 v R + /In) bit 13-2) rmination 13-11)	Exhibit 13-8 Influence AI Max D Exhibit 13-8 Influence AI Max D Exhibit 13-8	esirable f not F)	Violation?	$V_{FO} = V_F$ V_R Flow En V_{12} Level of $D_R = 34$ $LOS = D$ Speed D $D_S = 0.3$	terin	4440 966 g Diverg Actual 3543 vice Det 4.252 + 0.0 (mi/ln) bit 13-2) mination xhibit 13-1	Exhibit 13-8 Exhibit 13-10 ge Influence Max Desirab Exhibit 13-8 Exhi	7200 2100 2100 ce Area le 4400:All	No No Violation?
Flow Enterion V_{R12} Level of Selection $D_R = 5.475 + 0.08 = (\text{pc/mi.})$ Speed Determine $M_S = (\text{Exibit})$ $C_R = (\text{Exibit})$ $C_R = (\text{Exibit})$ $C_R = (\text{Exibit})$	Actual rvice Deterion 0.00734 v R + //In) bit 13-2) rmination t 13-11) exhibit 13-11)	Exhibit 13-8 Influence AI Max D Exhibit 13-8 Influence AI Max D Exhibit 13-8	esirable f not F)	Violation?	$V_{FO} = V_{F}$ V_{R} Flow En V_{12} Level of $D_{R} = 34$ $LOS = D$ Speed D $D_{S} = 0.3$ $S_{R} = 59$	TServ D _R = 4 .0 (pc. (Exhibit) 385 (E .2 mph	4440 966 g Diverg Actual 3543 vice Det 4.252 + 0.0 vimi/In) bit 13-2) mination xhibit 13-1 (Exhibit 1	Exhibit 13-8 Exhibit 13-10 Ge Influence Max Desirable Exhibit 13-8 Exhibit 13-10 Exhibit 13-8 Exh	7200 2100 2100 ce Area le 4400:All	No No Violation?
Flow Enterion V_{R12} Level of Set $D_R = 5.475 + 0$ $OS = (Exhib)$ Speed Dete $M_S = (Exibit)$	Actual rvice Deterion 0.00734 v R + /In) bit 13-2) rmination 13-11)	Exhibit 13-8 Influence AI Max D Exhibit 13-8 Influence AI Max D Exhibit 13-8	esirable f not F)	Violation?	$V_{FO} = V_{F}$ V_{R} Flow En V_{12} Level of $D_{R} = 34$ $LOS = D$ Speed D $S_{R} = 59$ $S_{0} = 74$	terin S Serv O _R = 4 .0 (pc. (Exhib) Oeter 385 (E .2 mph .1 mph	4440 966 g Diverg Actual 3543 vice Det 4.252 + 0.0 (mi/ln) bit 13-2) mination xhibit 13-1	Exhibit 13-8 Exhibit 13-10 ge Influence Max Desirab Exhibit 13-8 Exhibit 13-10 Exhibit 13-8 Exhibi	7200 2100 2100 ce Area le 4400:All	No No Violation?

	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	AECOM AM		Highway/Direction of Travel From/To Jurisdiction Analysis Year	I-95 SB Seg 13-E No-Build	Bet Off & On Ramps
Project Description SW 10th			7 maryolo 1 oan	710 24114	
✓ Oper.(LOS)			Des.(N)	□Pla	nning Data
Flow Inputs			•		
Volume, V AADT Peak-Hr Prop. of AADT, K	4180	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain:	0.95 3 0	
Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	General Ferfalls. Grade % Length Up/Down %	Level mi	
Calculate Flow Adjustr	nents				
f _p E _T	1.00 1.5		E_{R} $f_{HV} = 1/[1+P_{T}(E_{T}-1)+P_{R}(E_{R}-1)]$	1.2 0.985	
Speed Inputs			Calc Speed Adj and FFS	3	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	3		f _{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			·
LOS and Performance	Measures		Design (N)		
Operational (LOS) $v_p = (V \text{ or DDHV}) / (PHF \times N)$ S $D = v_p / S$ LOS	x f _{HV} x f _p) 1489 69.0 21.6 C	pc/h/ln mph pc/mi/ln	Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$ Required Number of Lanes, N	·	pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base freedour volume	-	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

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		F	REEWAY	/ WEAV	NG WOF	RKSHEE	т		
Gener	al Information				Site Info				
Analyst Agency/C Date Peri Analysis		AECOM AM	Л		Freeway/Dir Weaving Seg Analysis Yea	gment Locati		SB I4- Bet Samp uild 2020	le & Copans
	escription SW 10th	h Street SIMR	}		•				
Inputs	<u> </u>				1				
Weaving Weaving Freeway	configuration number of lanes, N segment length, L _s free-flow speed, FF	S S		1650ft 70 mph	Terrain type				Freeway 15 2400 Leve
Conve	ersions to po	1	1		î .	I –	Ι.	1 .	1 (")
	V (veh/h)	PHF	Truck (%)	RV (%)	E _T	E _R	f _{HV}	fp	v (pc/h)
V_{FF}	3575	0.95	3	0	1.5	1.2	0.985	1.00	3820
V_{RF}	1790	0.92	2	0	1.5	1.2	0.990	1.00	1965
V_{FR}	605	0.92	2	0	1.5	1.2	0.990	1.00	664
V_RR	0	0.95	0	0	1.5	1.2	1.000	1.00	0
V_{NW}	3820							V =	6449
V_W	2629								
VR	0.408								
Config	guration Cha	aracterist	tics		1				
Minimum	ı maneuver lanes, İ	N_{WL}		2 lc	Minimum we	eaving lane c	hanges, LC _{MIN}	ı	lc/h
Interchar	nge density, ID			0.7 int/mi	Weaving lan	e changes, L	$-C_{W}$		lc/h
Minimum	RF lane changes,	LC_{RF}		1 lc/pc	Non-weaving	g lane chang	es, LC _{NW}		lc/h
Minimum	FR lane changes,	LC_FR		1 lc/pc	Total lane ch	nanges, LC _{AL}	L		lc/h
Minimum	RR lane changes,	LC_{RR}		lc/pc	Non-weaving	g vehicle inde	ex, I _{NW}		551
Weavi	ng Segment	Speed,	Density, l	Level of	Service,	and Cap	oacity		
Weaving	segment flow rate, segment capacity,			6367 veh/h 5800 veh/h	Weaving seg	ensity factor, gment speed	, S		mph mph
Ŭ	segment v/c ratio	ח		1.098					
Ŭ	segment density, I Service, LOS	J		pc/mi/ln F	Maximum w		1111		mph 6767 ft
Notes					1		**** = *		

Notes

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a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

	BASIC FR	EEWAY SE	GMENTS WORKSHEE	Т	
General Information			Site Information		
Analyst			Highway/Direction of Trave	el <i>I-95 SB</i>	
Agency or Company	AECOM		From/To	Seg 1-E Palmett	Bet Hillsboro & o
Date Performed Analysis Time Period	PM		Jurisdiction Analysis Year	No-Buil	d 2020
Project Description SW 1	Oth Street SIM	1R			
☑ Oper.(LOS)			Des.(N)	Plar	nning Data
Flow Inputs					
Volume, V AADT	4990	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T	0.95 3	
Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	%RVs, P _R General Terrain: Grade % Length Up/Down %	0 Level mi	
Calculate Flow Adjus	tments				
f _p	1.00		E _R	1.2	
E _T	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	1)] 0.985	
Speed Inputs			Calc Speed Adj and	FFS	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	3		f _{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph		70.0	πρπ
LOS and Performanc	e Measures	3	Design (N)		
<u>Operational (LOS)</u> v _p = (V or DDHV) / (PHF x l	N x f _{HV} 1777	pc/h/ln	Design (N) Design LOS v _p = (V or DDHV) / (PHF x	N x f _{uv}	
x f _p)		·	x f _p)	110	pc/h/ln
S	66.1	mph	S P		mph
D = v _p / S	26.9	pc/mi/ln	$D = v_p / S$		pc/mi/ln
LOS	D		Required Number of Lanes	s, N	F
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service speed DDHV - Directional design	BFFS - Ba		E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-3	11-13	f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-1

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			REEWAY	WEAV	NG WOF	RKSHEE	T		
Genera	l Informati	on			Site Info	rmation			
Analyst Agency/Co Date Perfor Analysis Tir	med	AECOI PM	М		Freeway/Dir Weaving Seg Analysis Yea	gment Locati		SB 2-Bet On fromuild 2020	ı Exp & Off
Project Des	scription I-95 AT	HILLSBORC	BOULEVARD	IMR	l				
Inputs					1				
Weaving se Freeway fre	umber of lanes, Negment length, Lee-flow speed, Fl	S FS		5085ft 70 mph	Segment typ Freeway min Freeway max Terrain type	imum speed			Freeway 15 2400 Leve
Conver	V (veh/h)	PHF	Truck (%)	RV (%)	E _T	E _R	f _{HV}	fp	v (pc/h)
V _{FF}	4055	0.95	3	0	1.5	1.2	0.985	1.00	4332
V _{RF}	1105	0.92	2	0	1.5	1.2	0.990	1.00	1213
V _{FR}	935	0.92	2	0	1.5	1.2	0.990	1.00	1026
V _{RR}	125	0.92	2	0	1.5	1.2	0.990	1.00	137
V _{NW}	6571			<u> </u>	<u> </u>			V =	6708
V _W	137								<u> </u>
VR	0.020								
Configu	uration Cha	aracteris	tics						
Minimum m	naneuver lanes,	N_{WL}		0 lc	Minimum we	aving lane c	hanges, LC _{MIN}		411 lc/h
Interchange	e density, ID			0.7 int/mi	Weaving lan	e changes, L	$-C_{W}$		782 lc/h
Minimum R	RF lane changes,	LC_{RF}		0 lc/pc	Non-weaving	g lane chang	es, LC _{NW}		3154 lc/h
Minimum F	R lane changes,	LC_FR		0 lc/pc	Total lane ch	nanges, LC _{AL}	L		3936 lc/h
Minimum R	RR lane changes	, LC _{RR}		3 lc/pc	Non-weaving	g vehicle inde	ex, I _{NW}		2339
Weavin	g Segmen	t Speed,	Density, I	_evel of		-	_		
•	egment flow rate egment capacity.			6622 veh/h 6904 veh/h	Weaving inte	gment speed	, S		0.185 56.4 mph
•	egment v/c ratio	_	-	0.959	,				61.4 mph
_	egment density,	ט	39	9.6 pc/mi/ln					56.3 mph
Level of Se	ervice, LOS			E	Maximum we	eaving length	ı, L _{MAX}		5916 f

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a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed	AECOM		Highway/Direction of Travel From/To Jurisdiction	I-95 SB Seg 3-B	et Off & On Ramp
Analysis Time Period	PM		Analysis Year	No-Build	1 2020
Project Description SW 10to	h Street SIMR				
✓ Oper.(LOS)			Des.(N)	Pla	anning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K	5160	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R	0.95 3 0	
Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	General Terrain: Grade % Length Up/Down %	Level mi	
Calculate Flow Adjustr	nents				
f _p	1.00		E _R	1.2	
E _T	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
Speed Inputs			Calc Speed Adj and FFS	3	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_LW		mph
Number of Lanes, N	3		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			
LOS and Performance	Measures		Design (N)		
Operational (LOS) v _p = (V or DDHV) / (PHF x N x	65.3	pc/h/ln mph	Design (N) Design LOS v _p = (V or DDHV) / (PHF x N x S	$f_{HV} \times f_p)$	pc/h/ln mph
D = v _p / S LOS	28.2 D	pc/mi/ln	D = v _p / S Required Number of Lanes, N		pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base freeur volume	-	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

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	RA	MPS AND	RAMP JUN	CTIONS W	ORKSHI	EET				
General Infor				Site Infor						
Analyst			Fr	eeway/Dir of Tr		I-95 S				
Agency or Company	, AEC	OM		inction				Hillsboro WB		
Date Performed	7.20	•		Jurisdiction						
Analysis Time Perio	d PM		Ar	nalysis Year	No-Build 2020					
Project Description	SW 10th Stree	et SIMR								
Inputs										
Upstream Adj Ramp		Freeway Num	ber of Lanes, N	3					Downstre	am Adi
opstream Auj Namp		Ramp Numbe	r of Lanes. N	1					Ramp	aiii Auj
✓ Yes □ Or	า	1	ane Length, L	•					· ·	_
			7.	950					☐ Yes	On
☐ No ☑ Of	f		ane Length L _D						✓ No	Off
		Freeway Volu	me, V _F	5160					<u>.</u>	
L _{up} = 2175	ft	Ramp Volume	e, V _R	790					L _{down} =	ft
		Freeway Free	-Flow Speed, S _{FF}	70.0						le //e
$V_{\rm u} = 1060$	veh/h		ow Speed, S _{FR}	50.0					V _D =	veh/h
Camuaraian 1	nversion to pc/h Under Base Conditions									
Conversion t	o pc/n und	der Base	Conditions	ı	1	_				
(pc/h)	(Veh/hr)	PHF	Terrain	%Truck	%Rv		f _{HV}	f_p	v = V/PHF	$x f_{HV} x f_{p}$
Freeway	5160	0.95	Level	3	0	1).985	1.00	-	5513
Ramp	790	0.93	Level	2	0		0.990	1.00	-	867
· ·		1				$\overline{}$			 	
UpStream	1060	0.92	Level	2	0	+).990	1.00	1	164
DownStream	ownStream Merge Areas				Diverge Areas					
Estimation o		Weige Aleas			Estimat	ion	of v	iverge Areas		
LStillation of					LStilliati	1011	12			
	$V_{12} = V_{F}$	(P _{FM})					V ₄₀ = '	V _R + (V _F - V _F	.)P_p	
L _{EQ} =	2000.12	2 (Equation	13-6 or 13-7)					Equation 13		2)
P _{FM} =			ion (Exhibit 13-6)		L _{EQ} =					-
V ₁₂ =	3330		(=/		P _{FD} =			using Equation	on (Exhibit 1	3-7)
		•	on 12 14 or 12		V ₁₂ =		ŀ	oc/h		
V_3 or V_{av34}	2103 17)	pc/ii (⊏quati	on 13-14 or 13-		${ m V_3}$ or ${ m V_{av34}}$		1	pc/h (Equation	13-14 or 13-1	7)
Is V ₃ or V _{av34} > 2,70	,	e V No				34 > 2,	700 pc/h?	∃Yes □ No		
Is V_3 or $V_{av34} > 1.5$								□Yes □ No		
			40 40 40				12 L	oc/h (Equatio	n 13-16. 1	3-18. or
f Yes,V _{12a} =		pc/n (Equati 13-19)	on 13-16, 13-		If Yes,V _{12a} =			3-19)	,	,
Capacity Che		13-19)			Capacit	v Cr	nocks			
Capacity Cite	*	1 6	'anacity	1 100 52	Capacit	y Ci	i	1 00	no oitu	1.00.52
	Actual	1 7	apacity	LOS F?	\/		Actual	_	pacity	LOS F?
					V _F			Exhibit 13-	_	
V_{FO}	6380	Exhibit 13-8		No	$V_{FO} = V_{F}$	- V _R		Exhibit 13-	.8	
10					V _R			Exhibit 13	3-	
	<u> </u>				1			10		
Flow Entering	 	- O			Flow En	terii		rge Influer		
	Actual	1	Desirable	Violation?			Actual	Max Des	irable	Violation?
V_{R12}	4197	Exhibit 13-8	4600:AII	No	V ₁₂			Exhibit 13-8		
Level of Serv	ice Deterr	mination (if not F)			Ser	vice De	terminatio	n (if not	F)
	0.00734 v _R +				-			.0086 V ₁₂ - 0	•	•
D _R = 31.9 (pc/n	• • •	12	А			c/mi/		12	U	
	ŕ						•			
LOS = D (Exhibit					<u> </u>		it 13-2)			
Speed Determination					Speed Determination					
M _S = 0.485 (Exi	ibit 13-11)				$D_s = (E$	xhibit	13-12)			
· ·	(Exhibit 13-11)					ph (Ex	hibit 13-12)			
	. ,						hibit 13-12)			
•	(Exhibit 13-11)					. ,				
	(Exhibit 13-13)				S = m	pn (Ex	(hibit 13-13)			
t @ 2016 I Injuganitu	of Florida All Dia	lete December				4			0	d. E/21/2010

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	BASIC	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst			Highway/Direction of Travel	I-95 SB	
Agency or Company	AECOM		From/To	_	et WB On & EB On
Date Performed			Jurisdiction	Ramps	
Analysis Time Period	PM		Analysis Year	No-Build	1 2020
Project Description SW 10th	Street SIMR				
✓ Oper.(LOS)			Des.(N)	□Pla	nning Data
Flow Inputs					
Volume, V	5950	veh/h	Peak-Hour Factor, PHF	0.95	
AADT		veh/day	%Trucks and Buses, P _T	3	
Peak-Hr Prop. of AADT, K			%RVs, P _R	0	
Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	General Terrain: Grade % Length	Level mi	
DDIIV - AADIXKXD		Veri/II	Up/Down %	1111	
Calculate Flow Adjustn	nants				
	1.00		E _R	1.2	
f _p □	1.5			0.985	
E _T	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$		
Speed Inputs			Calc Speed Adj and FFS	<u> </u>	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	3		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			
LOS and Performance	Measures		Design (N)		
			Design (N)		
Operational (LOS)			Design LOS		
$v_p = (V \text{ or DDHV}) / (PHF x N x)$	(f _{HV} x f _p) 2119	pc/h/ln	$v_p = (V \text{ or DDHV}) / (PHF x N x)$	f xf)	pc/h/ln
S	60.2	mph	S (* 31 BB117) / (1 111 X 11 X	'HV ^ 'p/	mph
$D = v_p / S$	35.2	pc/mi/ln	D = v _n / S		pc/mi/ln
LOS	E		P .		рс/пп/п
			Required Number of Lanes, N		
Glossary			Factor Location		
N - Number of lanes	S - Speed		E Evhibite 11 10 11 12		f Evhihit 11.0
V - Hourly volume	D - Density		E _R - Exhibits 11-10, 11-12	12	f _{LW} - Exhibit 11-8
v _p - Flow rate	FFS - Free-flow	speed	E _T - Exhibits 11-10, 11-11, 11-	-10	f _{LC} - Exhibit 11-9
LOS - Level of service	BFFS - Base fr	ee-flow speed	f _p - Page 11-18	2 11 2	TRD - Page 11-1
DDHV - Directional design ho	ur volume		LOS, S, FFS, v _p - Exhibits 11-	∠, 11-3	

			FREEWAY	<u> WEAVI</u>	NG WOR	RKSHEE	T		
Genera	Informati	on			Site Info	rmation			
Analyst Agency/Cor Date Perfor Analysis Tin	med	AECO PM	М		Freeway/Dir Weaving Seg Analysis Yea	gment Locati		SB S- Bet Hillsbor uild 2020	o & 10th St
Project Des	cription SW 10t	h Street SIMI	₹						
Inputs					•				
Weaving se Freeway fre	mber of lanes, N gment length, L e-flow speed, F	s FS		1830ft 70 mph	Segment typo Freeway min Freeway max Terrain type	imum speed			Freeway 15 2400 Leve
Conver	sions to po	1		1			Ι,	Ι,	((1)
.,	V (veh/h)	PHF	Truck (%)	RV (%)	E _T	E _R	f _{HV}	fp	v (pc/h)
V _{FF}	4700	0.95	3	0	1.5	1.2	0.985	1.00	5022
V_{RF}	710	0.92	2	0	1.5	1.2	0.990	1.00	779
V _{FR}	1250	0.92	2	0	1.5	1.2	0.990	1.00	1372
V_{RR}	0	0.95	0	0	1.5	1.2	1.000	1.00	0
V _{NW}	5022							V =	7173
V _W	2151								
VR	0.300								
Configu	ration Cha	aracteris	tics		1				
Minimum m	aneuver lanes,	N_{WL}		2 lc		-	hanges, LC _{MIN}	ı	779 lc/h
	e density, ID			0.7 int/mi	Weaving lan	e changes, L	$_{C_{W}}$		1152 lc/h
Minimum R	F lane changes,	LC_RF		1 lc/pc	Non-weaving	g lane chang	es, LC _{NW}		1256 lc/h
Minimum F	R lane changes,	LC _{FR}		0 lc/pc	Total lane ch	nanges, LC _{AL}	L		2408 lc/h
Minimum R	R lane changes	, LC _{RR}		lc/pc	Non-weaving	g vehicle inde	ex, I _{NW}		643
Weavin	g Segmen	t Speed,	Density, I	_evel of	Service,	and Cap	oacity		
Weaving se	gment flow rate	, V		7078 veh/h	Weaving inte	•			0.281
Weaving se	gment capacity	, c _w		7885 veh/h	Weaving seg				56.4 mph
•	gment v/c ratio			0.898	Average wea		**		57.9 mph
•	gment density,	D	3.	1.8 pc/mi/ln					55.8 mph
LAVAL OF CA	rvice, LOS			D	Maximum we	eaving length	1, L _{MAX}		5583 ft

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

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	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed	AECOM		Highway/Direction of Travel From/To Jurisdiction	I-95 SB Seg 7-B	et Off & On Ramp
Analysis Time Period	PM		Analysis Year	No-Build	d 2020
Project Description SW 10	th Street SIMR				
✓ Oper.(LOS)		Des.(N)	Pla	anning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K	5410	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R	0.95 3 0	
Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	General Terrain: Grade % Length Up/Down %	Level mi	
Calculate Flow Adjust	ments				
f _p	1.00		E _R	1.2	
Ė _T	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
Speed Inputs			Calc Speed Adj and FFS	3	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	3		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			
LOS and Performance	Measures		Design (N)		
<u>Operational (LOS)</u> v _p = (V or DDHV) / (PHF x N S	x f _{HV} x f _p) 1927 63.9	pc/h/ln mph	Design (N) Design LOS v _p = (V or DDHV) / (PHF x N x	$f_{HV} \times f_p$)	pc/h/ln
D = v _p / S	30.2	pc/mi/ln	S		mph
LOS	D	r ·	D = v _p / S Required Number of Lanes, N		pc/mi/ln
Glossary			Factor Location		
N - Number of lanes	S - Speed				
V - Hourly volume	S - Speed D - Density		E _R - Exhibits 11-10, 11-12		f _{LW} - Exhibit 11-8
v _p - Flow rate	FFS - Free-flow	sneed	E _T - Exhibits 11-10, 11-11, 11-	-13	f _{LC} - Exhibit 11-9
V _p - Flow rate LOS - Level of service	BFFS - Base from	-	f _p - Page 11-18		TRD - Page 11-11
		se-now speed	LOS, S, FFS, v _p - Exhibits 11-	2, 11-3	
DDHV - Directional design he	oui voiuirie		· ·		

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	RA	MPS AND	RAMP JUN	CTIONS W	ORKSHE	EET				
General Info				Site Infor						
Analyst			Fr	eeway/Dir of Tr	Travel I-95 SB					
Agency or Company	, AEC	OM		nction			- -Merge from	10th St		
Date Performed			Ju	urisdiction						
Analysis Time Perio	d PM		Ar	nalysis Year		No-Βι	uild 2020			
Project Description	SW 10th Stree	et SIMR								
Inputs										
Upstream Adj Ramp)	Freeway Num	ber of Lanes, N	3					Downstre	am Adj
		Ramp Numbe	r of Lanes, N	1					Ramp	•
✓ Yes □ O	n	Acceleration L	ane Length, L _A	1470					□Yes	☐ On
☐ No ☑ Ot	et	Deceleration I	ane Length L _D							
□ NO ☑ OI	II.	Freeway Volu		5410					✓ No	Off
- _{up} = 2210	ft	Ramp Volume	•	1220					L _{down} =	ft
ир		1	-Flow Speed, S _{FF}	70.0						
V _u = 1250	veh/h			70.0 50.0					V _D =	veh/h
	Ramp Free-Flow Speed, S _{FR}									
Conversion t	onversion to pc/h Under Base Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv		${\sf f}_{\sf HV}$	f_p	v = V/PH	x f _{HV} x f _p
Freeway	5410	0.95	Level	3	0	1).985	1.00		5780
Ramp	1220	0.92	Level	2	0	_	0.990	1.00		1339
UpStream	1250	0.92	Level	2	0	_).990	1.00		1372
DownStream	1230	0.32	Level		"	+	7.330	1.00		1312
Down ou can	Merge Areas				Diverge Areas					
Estimation o					Estimati	ion (of v ₁₂			
	V ₁₂ = V _F	(P)								
ı –			10.0 ~ 10.7)				$V_{12} = $	$V_R + (V_F - V_I)$	_R)P _{FD}	
L _{EQ} =			13-6 or 13-7)		L _{EQ} =		((Equation 13	3-12 or 13-1	3)
P _{FM} =			ion (Exhibit 13-6)		P _{FD} =		ι	using Equati	on (Exhibit 1	3-7)
V ₁₂ =	3510	•	10.1110		V ₁₂ =		ı	oc/h		
V ₃ or V _{av34}	2270 17)	pc/n (Equation	on 13-14 or 13-		${ m V_3}$ or ${ m V_{av34}}$			pc/h (Equation	13-14 or 13-1	7)
Is V ₃ or V _{av34} > 2,70	,	s VNo				34 > 2,	700 pc/h?	∃Yes □ No)	
Is V_3 or $V_{av34} > 1.5$								☐Yes ☐ No		
			on 13-16, 13-		If Yes,V _{12a} =		12 <u>-</u>	oc/h (Equatio	on 13-16, 1	3-18, or
f Yes,V _{12a} =		13-19)	011 13-10, 13-		11 165, v _{12a} –		13	3-19)		
Capacity Che		,			Capacity	y Ch	ecks			
	Actual		apacity	LOS F?			Actual	Ca	apacity	LOS F?
					V _F			Exhibit 13		
V	7440	F.,L;L;L;40,0		NI-	$V_{FO} = V_{F}$	- V-		Exhibit 13	-8	
V_{FO}	7119	Exhibit 13-8		No		·R		Exhibit 13		
					V_R			10	5	
Flow Enterin	g Merge Ir	nfluence A	rea		Flow En	terii	ng Dive	rge Influe	nce Area	
·	Actual	· ·	Desirable	Violation?			Actual	Max Des		Violation?
V _{R12}	4849	Exhibit 13-8	4600:All	Yes	V ₁₂			Exhibit 13-8		
Level of Serv	rice Deterr		if not F)			Ser	vice De	terminatio	on (if not	F)
	· 0.00734 v _R +				-			.0086 V ₁₂ - 0	•	
D _R = 33.5 (pc/n	• • • • • • • • • • • • • • • • • • • •	12	А			- ĸ ic/mi/		- 12	יטי	
	•						•			
OS = D (Exhibit	•				· `		it 13-2)			
Speed Deteri	mination				Speed D			on		
$M_S = 0.672 (Ex$	ibit 13-11)				,		13-12)			
S _R = 51.2 mph	(Exhibit 13-11)				S _R = mp	ph (Ex	hibit 13-12)			
S_0 = 63.6 mph (Exhibit 13-11) S_0 = mph (Exhibit 13-12)										
•	(Exhibit 13-13)				S = mp	ph (Ex	hibit 13-13)			
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	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed	AECOM		Highway/Direction of Travel From/To Jurisdiction	I-95 SB Seg 9-B	et 10th & Exit to Exp
Analysis Time Period	PM		Analysis Year	No-Build	1 2020
Project Description SW 10t	h Street SIMR				
✓ Oper.(LOS)			Des.(N)	Pla	anning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K	6630	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R	0.95 3 0	
Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	General Terrain: Grade % Length Up/Down %	Level mi	
Calculate Flow Adjustr	ments				
f_p	1.00		E _R	1.2	
E _T	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
Speed Inputs			Calc Speed Adj and FFS	3	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	3		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			
LOS and Performance	Measures		Design (N)		
Operational (LOS) $v_p = (V \text{ or DDHV}) / (PHF \times N)$ S $D = v_p / S$ LOS	x f _{HV} x f _p) 2361 54.4 43.4 E	pc/h/ln mph pc/mi/ln	Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$ Required Number of Lanes, N	$f_{HV} \times f_p$)	pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
•	0 0		. actor Ecounom		
 N - Number of lanes V - Hourly volume v_p - Flow rate LOS - Level of service DDHV - Directional design ho 	S - Speed D - Density FFS - Free-flow BFFS - Base free	-	E_R - Exhibits 11-10, 11-12 E_T - Exhibits 11-10, 11-11, 11- f_p - Page 11-18 LOS, S, FFS, v_p - Exhibits 11-2		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

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		RAMP	S AND RAM	P JUNCTI	ONS WO	ORKS	HEET			
General Info	rmation			Site Infor	mation					
Analyst			Fr	eeway/Dir of Tr	avel	I-95 SE	}			
Agency or Company	y AEC	OM		nction		Seg 10	- Diverge to	Express		
Date Performed Analysis Time Perio	od PM			risdiction nalysis Year		No Dui	4 3040			
Project Description		t SIMR	Al	iaiysis reai		No-Bui	u 2040			
Inputs	OVV TOUT OU CC	CONVINC								
	5	Freeway Num	ber of Lanes, N	3					Б (A 1'
Upstream Adj f	Kamp	Ramp Numbe		1					Downstrea Ramp	ım Aaj
✓ Yes	√ On	l '	ane Length, L _Δ	'					-	
			ane Length L _n	300					☐ Yes	On
□ No [Off	Freeway Volume	- 5	6630					✓ No	Off
L _{up} = 6	000 ft	Ramp Volume	•	720					L _{down} =	ft
ир			·, v _R -Flow Speed, S _{FF}	70.0						
V _u = 1:	220 veh/h	-	ow Speed, S _{FR}						$V_D =$	veh/h
Comunatan	40 mg/lg 11m		111	45.0						
Conversion	to pc/n Uno	der Base (Conditions	1	1	_				
(pc/h)	(Veh/hr)	PHF	Terrain	%Truck	%Rv		f_{HV}	f_p	v = V/PHF	$x f_{HV} x f_{p}$
Freeway	6630	0.95	Level	3	0	0.	985	1.00	70	84
Ramp	720	0.92	Level	2	0	0.	990	1.00	79	90
UpStream	1220	0.92	Level	2	0	0.	990	1.00	13	39
DownStream		<u> </u>								
Estimation o		Merge Areas			Estima	tion o		verge Areas		
LStillation o					LSuma	lion o				
	$V_{12} = V_{F}$							$V_R + (V_F - V_F)$		
L _{EQ} =		ation 13-6 or	•		L _{EQ} =			00.18 (Equati		•
P _{FM} =	-	Equation (E	Exhibit 13-6)		P _{FD} =			47 using Equ	uation (Exhi	bit 13-7)
V ₁₂ =	pc/h				V ₁₂ =			30 pc/h		
V ₃ or V _{av34}			-14 or 13-17)		V ₃ or V _{av34}			54 pc/h (Equa	ation 13-14	or 13-17)
Is V_3 or $V_{av34} > 2.7$								Yes No		
Is V ₃ or V _{av34} > 1.5			10 10 10		Is V ₃ or V _a	_{v34} > 1.5		Yes ☑ No		
If Yes,V _{12a} =	pc/n (13-19		-16, 13-18, or		If Yes,V _{12a}	=		34 pc/h (Equa 13-19)	ation 13-16	5, 13-18,
Capacity Ch		/			Capaci	tv Ch		10 10)		
	Actual	С	apacity	LOS F?			Actual	Ca	pacity	LOS F?
			•		V _F		7084	Exhibit 13-8	7200	No
V_{FO}		Exhibit 13-8			V _{FO} = V	_F - V _R	6294	Exhibit 13-8	7200	No
10					V_{R}		790	Exhibit 13-1	0 2100	No
Flow Enterin	a Merae Ir	lluence Δ	rea					ge Influen		
ou Lineilli	Actual		Desirable	Violation?	, , , , , , , , , , , , , , , , , , ,		Actual	Max Desirab		Violation?
V _{R12}		Exhibit 13-8			V ₁₂		230	Exhibit 13-8	4400:All	No
Level of Serv	rice Deterr	nination (i	if not F)	<u> </u>		f Serv	ice Det	erminatio	n (if not	
$D_R = 5.475 + 0$		`						0086 V ₁₂ - 0.0	_ •	,
D _R = (pc/mi/lı	• • • • • • • • • • • • • • • • • • • •	12	^		D _R = 4	1.1 (pc		12	D	
LOS = (Exhibit	•				1	٠.	oit 13-2)			
Speed Deter							minatio			
					 ' 		xhibit 13-			
M _S = (Exibit 1	·-						(Exhibit 1	•		
	hibit 13-11)						(Exhibit 1	-		
	hibit 13-11) hibit 13-13)				1 -		(Exhibit 1	-		
right © 2016 Universi	•				0 - 0	-		· · · · · · · · · · · · · · · · · · ·	Generated: 5/	

	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	AECOM PM		Highway/Direction of Travel From/To Jurisdiction Analysis Year	I-95 SB Seg 11-L No-Build	Bet Off Exp Off Sample
Project Description SW 10th			Analysis Teal	TVO-Balla	2020
✓ Oper.(LOS)			Des.(N)	□ Pla	nning Data
Flow Inputs			. ,		Ü
Volume, V AADT Peak-Hr Prop. of AADT, K	5910	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R	0.95 3 0	
Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	General Terrain: Grade % Length Up/Down %	Level mi	
Calculate Flow Adjustr	nents				
f _p E _T	1.00 1.5		E_{R} $f_{HV} = 1/[1+P_{T}(E_{T}-1)+P_{R}(E_{R}-1)]$	1.2 0.985	
Speed Inputs			Calc Speed Adj and FFS	3	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	3		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			
LOS and Performance	Measures		Design (N)		
Operational (LOS) v _p = (V or DDHV) / (PHF x N s S D = v _p / S LOS	x f _{HV} x f _p)2105 60.5 34.8 D	pc/h/ln mph pc/mi/ln	Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$ Required Number of Lanes, N	$f_{HV} \times f_p$)	pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base freeur volume	-	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

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		RAMP	S AND RAM			RKS	HEET			
General Info	rmation			Site Infor						
Analyst				eeway/Dir of Tr	avel	I-95 SE				
Agency or Compan	y AEC	OM		nction risdiction		Seg 12	2- Diverge to	Sample Rd		
Date Performed Analysis Time Peric	od PM			nsdiction alysis Year		No-Rui	ild 2020			
Project Description		et SIMR	741	lary 515 T Car		NO-Dui	110 Z0Z0			
Inputs										
Upstream Adj I	Ramn	Freeway Num	ber of Lanes, N	3					Downstre	am Adi
opolioum / taj i	Tamp	Ramp Numbe	er of Lanes, N	1					Ramp	annnaj
✓ Yes	On	Acceleration I	_ane Length, L _Δ						Yes	☐ On
□ No [✓ Off		Lane Length L _D	250						
	V OII	Freeway Volu	me, V _F	5910					✓ No	Off
L _{up} = 2	000 ft	Ramp Volume	e, V _p	1110				I	L _{down} =	ft
			-Flow Speed, S _{FF}	70.0				Į,	\	1- //-
$V_u = 7$	20 veh/h		low Speed, S _{FR}	45.0					$V_D =$	veh/h
Conversion	to pc/h Un		111							
(pc/h)	V	PHF	Terrain	%Truck	%Rv		f	f	, = \//DHE	x f _{HV} x f _p
. ,	(Veh/hr)		Terrairi		ļ	_	f_{HV}	· ·		<u> </u>
Freeway	5910	0.95	Level	3	0	_	.985	1.00		314
Ramp	1110	0.92	Level	2	0		.990	1.00		219
UpStream	720	0.92	Level	2	0	0.	.990	1.00	7	90
DownStream		Marga Arasa						iverge Areas		
Estimation o	of V	Merge Areas			Estimat	tion o		iverge Areas		
		(D)			LStimat			., ., .,	\ <u> </u>	
	$V_{12} = V_{F}$	• • • • • • • • • • • • • • • • • • • •						$V_R + (V_F - V_R)$		
_{-EQ} =		ation 13-6 or	•		L _{EQ} =		•	Equation 13-12		•
P _{FM} =	using	Equation (Exhibit 13-6)		P _{FD} =			546 using Equ	iation (Exh	ibit 13-7)
/ ₁₂ =	pc/h				V ₁₂ =		40	01 pc/h		
V_3 or V_{av34}	pc/h	(Equation 13	-14 or 13-17)		V_3 or V_{av34}		23	13 pc/h (Equa	ation 13-1	4 or 13-17)
Is V_3 or $V_{av34} > 2.7$	00 pc/h?	s 🗌 No			Is V ₃ or V _{av}	_{v34} > 2,7	'00 pc/h? []Yes ☑ No		
Is V ₃ or V _{av34} > 1.5	* V ₁₂ /2	s 🗌 No			Is V ₃ or V _{av}	_{/34} > 1.5	5 * V ₁₂ /2]Yes ☑No		
f Yes,V _{12a} =	pc/h	(Equation 13	-16, 13-18, or		If Yes,V _{12a}	=		c/h (Equation	13-16, 13	-18, or 13-
Capacity Ch	13-19)			Capacit		19 00 ks))		
Sapacity City	Actual	1 (Capacity	LOS F?	Capacit	y Cii	Actual	Car	oacity	LOS F?
	Actual		σαρασιτή	LOGTE	V _F		6314	Exhibit 13-8	1	No
W		Evhibit 40.0			<u> </u>			_	-	
V_{FO}		Exhibit 13-8			$V_{FO} = V_{FO}$		5095	Exhibit 13-8		No
	<u> </u>	1			V _R		1219	Exhibit 13-10		No
Flow Enterin		_		\/;e1=4:0	Flow Er			ge Influenc		1 1/:-1-0 0
	Actual	1	Desirable	Violation?	\/	_	Actual	Max Desirabl		Violation?
V _{R12}	<u> </u>	Exhibit 13-8	(f		V ₁₂		4001	Exhibit 13-8	4400:All	No No
DVALAT SAM	vice Deteri							termination		<i>F)</i>
	• • • • • • • • • • • • • • • • • • • •	0.0078 V ₁₂	- 0.00627 L _A					0086 V ₁₂ - 0.0	009 L _D	
D _R = 5.475 + 0						8.1 (pc	/mi/ln)			
$D_R = 5.475 + 0$	n)				LOS = E	(Exhil	bit 13-2)			
$D_R = 5.475 + 0$ $D_R = (pc/mi/lough)$ $D_R = (Exhibit)$	13-2)									
$D_R = 5.475 + 0$ $D_R = (pc/mi/locus)$ $D_R = (Exhibit)$	13-2)				Speed I	Deter	minatio	n		
$D_R = 5.475 + 0$ $D_R = (pc/mi/l)$ $LOS = (Exhibit)$ Speed Deter	13-2) mination						minatio xhibit 13-			
$D_R = 5.475 + 0$ $D_R = (pc/mi/let)$ $LOS = (Exhibit)$ $COS = (Exhibit)$ $COS = (Exhibit)$ $COS = (Exhibit)$	13-2) mination 13-11)				$D_s = 0$.408 (E		12)		
$D_R = 5.475 + 0$ $D_R = (pc/mi/license)$ $D_R = (pc/$	13-2) mination 13-11) hibit 13-11)				D _s = 0 S _R = 5	.408 (E 8.6 mph	xhibit 13-	12) 13-12)		
$D_R = 5.475 + 0$ $D_R = (pc/mi/le)$ $D_R = (pc/mi/le)$ $D_R = (Exhibit)$ $D_R = (E$	13-2) mination 13-11)				$D_{s} = 0$ $S_{R} = 5$ $S_{0} = 7$.408 (E 8.6 mph 2.4 mph	xhibit 13- n (Exhibit	12) 13-12) 13-12)		

	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	AECOM PM		Highway/Direction of Travel From/To Jurisdiction Analysis Year	I-95 SB Seg 13-E No-Build	Bet Off & On Ramps
Project Description SW 10ti	h Street SIMR				
✓ Oper.(LOS)		1	Des.(N)	□Pla	nning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K	4800	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R	0.95 3 0	
Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	General Terrain: Grade % Length Up/Down %	Level mi	
Calculate Flow Adjustr	nents				
f _p E _T	1.00 1.5		E_{R} $f_{HV} = 1/[1+P_{T}(E_{T}-1)+P_{R}(E_{R}-1)]$	1.2 0.985	
Speed Inputs			Calc Speed Adj and FFS	3	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	3		f _{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			•
LOS and Performance	Measures		Design (N)		
Operational (LOS) v _p = (V or DDHV) / (PHF x N : S D = v _p / S LOS	x f _{HV} x f _p) 1709 67.0 25.5 C	pc/h/ln mph pc/mi/ln	Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$ Required Number of Lanes, N	$f_{HV} \times f_p$)	pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base fre	-	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

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		F	REEWAY	WEAVI	NG WOR	KSHEE	T		
Genera	l Informatio	on			Site Info	rmation			
Analyst Agency/Cor Date Perfor Analysis Tir	med	AECON PM	1		Freeway/Dir Weaving Seg Analysis Yea	ment Locati	•	B 4- Bet Sampl iild 2020	e & Copans
Project Des	cription SW 10tl	n Street SIMR							
Inputs					1				
Weaving se Freeway fre	umber of lanes, Negment length, Lee-flow speed, FF	S FS		1650ft 70 mph	Segment typo Freeway min Freeway max Terrain type	imum speed			Freeway 15 2400 Leve
Conver	sions to po			1	1	_		<u> </u>	
	V (veh/h)	PHF	Truck (%)	RV (%)	E _T	E _R	f _{HV}	fp	v (pc/h)
V _{FF}	4170	0.95	3	0	1.5	1.2	0.985	1.00	4455
V_{RF}	1420	0.92	2	0	1.5	1.2	0.990	1.00	1559
V_{FR}	630	0.92	2	0	1.5	1.2	0.990	1.00	692
V_RR	0	0.95	0	0	1.5	1.2	1.000	1.00	0
V_{NW}	4455							V =	6706
V_W	2251								
VR	0.336								
Configu	uration Cha	aracterist	ics		1				
Minimum m	naneuver lanes, I	N_{WL}		2 lc	Minimum we	aving lane c	hanges, LC _{MIN}		2251 lc/h
•	e density, ID			0.7 int/mi	Weaving lan	e changes, L	.C _w		2602 lc/h
Minimum R	RF lane changes,	LC_{RF}		1 lc/pc	Non-weaving	lane chang	es, LC _{NW}		1042 lc/h
Minimum F	R lane changes,	LC_FR		1 lc/pc	Total lane ch	anges, LC _{AL}	L		3644 lc/h
Minimum R	R lane changes,	LC_{RR}		lc/pc	Non-weaving	yehicle inde	ex, I _{NW}		515
Weavin	g Segment	Speed,	Density, I	_evel of	Service,	and Cap	oacity		
Ŭ	egment flow rate, egment capacity,			6618 veh/h 7044 veh/h	Weaving inte	ment speed	, S		0.422 48.1 mph
Weaving se	egment v/c ratio	•		0.939	Average wea	aving speed,	S_W		53.7 mph
_	, ,								
Level of Se	ervice, LOS			D	Maximum we	eaving length	n, L _{MAX}		5970 ft
Notes									

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

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