			REEWA	Y WEAV	ING WOF	RKSHEE	Т			
Genera	al Informati	on			Site Info	ormation				
Analyst Agency/Co Date Perfo Analysis T	ompany rmed ime Period	AECO AM	М		Freeway/Dir Weaving Seg Analysis Yea	Freeway/Dir of Travel I-95 NB Weaving Segment Location Seg 1-Bet Copans & Sar Analysis Year 2040 Build 2				
Project De	scription SW 10	th Street SIM	२							
Inputs					.					
Weaving configuration One-Sid Weaving number of lanes, N Weaving segment length, Ls Weaving segment length, Ls 238 Freeway free-flow speed, FFS 70 m					Segment type Free Freeway minimum speed, S _{MIN} Freeway maximum capacity, C _{IFL} 2					
Conve	rsions to p	c/h Unde	r Base Co	ondition	s				-	
	V (veh/h)	PHF	Truck (%)	RV (%)	Ε _Τ	E _R	f _{HV}	fp	v (pc/h)	
V _{FF}	4690	0.95	3	0	1.5	1.2	0.985	1.00	5011	
V _{RF}	420	0.92	2	0	1.5	1.2	0.990	1.00	461	
V _{FR}	970	0.92	2	0	1.5	1.2	0.990	1.00	1065	
V _{RR}	0	0.95	0	0	1.5	1.2	1.000	1.00	0	
V _{NW}	5011			•	-			V =	6537	
V _w	1526									
VR	0.233									
Config	uration Ch	aracteris	tics		•					
Minimum ı	maneuver lanes,	N _{WL}		2 lc	Minimum we	eaving lane c	hanges, LC _{MIN}	l	1526 lc/ł	
Interchang	je density, ID			0.7 int/mi	Weaving lan	ne changes, L	-C _w		1961 lc/ł	
Minimum I	RF lane changes	, LC _{RF}		1 lc/pc	Non-weaving	g lane chang	es, LC _{NW}		1552 lc/ł	
Minimum I	FR lane changes	, LC _{FR}		1 lc/pc	Total lane cl	hanges, LC _{AL}	L		3513 lc/ł	
Minimum I	RR lane changes	, LC _{RR}		lc/pc	Non-weaving	g vehicle inde	ex, I _{NW}		835	
Weavir	ng Segmen	t Speed,	Density,	Level of	Service,	and Cap	oacity			
Weaving s	segment flow rate	e, V		6448 veh/h	Weaving inte	ensity factor,	W		0.307	
Weaving s	Neaving segment capacity, c _w 8705 veh					gment speed	, S		52.4 mpł	
Weaving s	Neaving segment v/c ratio 0.74					aving speed,	S _W		57.1 mpł	
Weaving s	Weaving segment density, D 31.2 pc/mi/lr					$_{\rm n}$ Average non-weaving speed, S $_{\rm NW}$			51.2 mpł	
Level of S	ervice, LOS			D	Maximum weaving length, L _{MAX} 4881				4881 f	
Notes										
a. Weaving Chapter 13	segments longer t	han the calculation of the calcu	ated maximum le	ength should	be treated as is	solated merge	and diverge ar	eas 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		
0					
General Information			Site Information		
Analyst			Highway/Direction of Travel	I-95 NB Sea 2-B	et Off & On from
Agency or Company	AECOM		From/To	Sample	
Date Performed Analysis Time Period	AM		Jurisdiction Analysis Year	2040 Bu	ild 2
Project Description SW 10	th Street SIMR				
✓ Oper.(LOS	6)		Des.(N)	Pla	anning Data
Flow Inputs					
Volume, V	5110	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		voh/h	General Terrain:	Level	
		Ven/m	Up/Down %	1111	
Calculate Flow Adjust	monte				
	4.00				
	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 FF	S	
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	6	mph			
LOS and Performance	e Measures		Design (N)		
			Desian (N)		
Operational (LOS)			Design LOS		
v _p = (V or DDHV) / (PHF x N	l x f _{HV} x f _p) 1820	pc/h/ln	$v_{\rm p} = (V \text{ or DDHV}) / (PHF x N x)$	(f _{uv} x f _n)	pc/h/ln
S	65.5	mph	S	nv p	mph
$D = v_p / S$	27.8	pc/mi/ln	D = v_ / S		pc/mi/ln
LOS	D		ہ Required Number of Lanes, N	I	F
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 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 fre	e-flow speed	f _p - Page 11-18		TRD - Page 11-11
DDHV - Directional design h	iour volume	ie non opoou	LOS, S, FFS, v _p - Exhibits 11-	-2, 11-3	

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Job: SW 10th Street SIMR Analyst: AECOM



<u>its 25-3 and 25-7):</u>	Maximum	Actual	V/c	LOS F?
70 mph free-flow speed) =	9,600	7,009	0.73	No
) mph free-flow speed) =	7,200	5,460	0.76	No
mph free-flow speed) =	2,100	1,542	0.73	No
	<pre>pits 25-3 and 25-7): > 70 mph free-flow speed) = 0 mph free-flow speed) = 5 mph free-flow speed) =</pre>	Its 25-3 and 25-7):Maximuma 70 mph free-flow speed) =9,6000 mph free-flow speed) =7,2005 mph free-flow speed) =2,100	Its 25-3 and 25-7): Maximum Actual # 70 mph free-flow speed) = 9,600 7,009 0 mph free-flow speed) = 7,200 5,460 5 mph free-flow speed) = 2,100 1,542	DITS 25-3 and 25-7): Maximum Actual V/c \$70 mph free-flow speed) = 9,600 7,009 0.73 0 mph free-flow speed) = 7,200 5,460 0.76 5 mph free-flow speed) = 2,100 1,542 0.73

RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Info	rmation			Site Infor	mation					
Analyst			Fr	eeway/Dir of Tra	ravel I-95 NB					
Agency or Compan	y AEC	ОМ	Ju	inction		Seg 4	-On from Ex	(p		
Date Performed	-		Ju	irisdiction		•				
Analysis Time Peric	d AM		Ar	nalysis Year		2040 I	Build 2			
Project Description	SW 10th Stree	t SIMR								
Inputs										
Linstream Adi Rami	n	Freeway Num	ber of Lanes, N	4					Downstre	am Adi
	,	Ramp Numbe	r of Lanes, N	1					Ramp	
🗌 Yes 🗌 O	'n	Acceleration I	ane Length L.	1500						
		Deceloration	and Longth L	1000					I Yes	On
🗹 No 🛛 🗆 O	ff								🗌 No	✓ Off
		Freeway Volu	me, V _F	6560						0050 #
L _{up} = π		Ramp Volume	e, V _R	830					-down -	2950 11
	L	Freeway Free	-Flow Speed, S _{FF}	70.0					V_ =	180 veh/h
v _u – ven/	ri -	Ramp Free-Fl	ow Speed, S _{FR}	50.0					•D	
Conversion	to pc/h Un	der Base	Conditions						I	
(pc/h)	V	PHF	Terrain	%Truck	%Rv		fuv	fn	v = V/PHF	x f _{uv} x f
	(Veh/hr)	0.05						р 1.00		
Freeway	6560	0.95	Level	3	0	0	0.985	1.00	(009
Ramp	830	0.92	Level	2	0	0).990	1.00		911
DownStream	100	0.00	Laval		0		000	1.00		100
DownStream	100	U.92 Morgo Aroas	Level	2	0	0).990 r			190
Estimation of	f v	werge Areas			Diverge Areas					
	12				LStimat		12			
	$V_{12} = V_{F}$	(P _{FM})					$V_{12} = 1$	V _P + (V _F - V _P)P _{ED}	
L _{EQ} =	(Equ	ation 13-6 o	r 13-7)				12	(Equation 13-	12 or 13-1	3)
P _{FM} =	0.104	using Equat	tion (Exhibit 13-6)	1	-EQ P =			using Equation	n (Evhibit 13	-7)
V ₁₂ =	728 p	c/h			FD			aoling Equatio		,,
	3140	pc/h (Equati	on 13-14 or 13-		v ₁₂		1			
v ₃ 01 v _{av34}	17)				v ₃ or v _{av34}			pc/n (Equation 1	3-14 or 13-1	()
Is V ₃ or V _{av34} > 2,7	00 pc/h? 🗹 Ye	s 🗌 No			Is V ₃ or V _{av}	₃₄ > 2,	700 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 * V ₁₂ /2	Yes No		
If Yes V =	2803	pc/h (Equati	on 13-16, 13-		If Yes,V _{12a} =	=	1	pc/h (Equation	n 13-16, 1	3-18, or
12a	18, or	13-19)			120		1.	5-19)		
Capacity Ch	ecks				Capacit	y Ch	necks			
	Actual		Capacity	LOS F?			Actual	Car	pacity	LOS F?
					V _F			Exhibit 13-8	8	
Vro	7920	Exhibit 13-8		No	$V_{FO} = V_{F}$	- V _R		Exhibit 13-8	8	
FO					V			Exhibit 13	-	
					۲R			10		
Flow Enterin	ig Merge In	fluence A	lrea		Flow En	<u>iterii</u>	ng Dive	rge Influen	ce Area	
	Actual	Max	Desirable	Violation?		_	Actual	Max Desi	rable	Violation?
V _{R12}	4050	Exhibit 13-8	4600:All	No	V ₁₂			Exhibit 13-8		
Level of Ser	vice Detern	nination (if not F)		Level of	f Ser	vice De	terminatio	n (if not	<i>F</i>)
D _R = 5.475			D _R =	4.252 + 0	.0086 V ₁₂ - 0.	.009 L _D				
D _R = 29.0 (pc/	mi/ln)				D _R = (p	oc/mi/	ln)			
LOS = D (Exhibi	t 13-2)				LOS = (E	Exhibi	it 13-2)			
Speed Deter		Speed L	Deter	rminatio	on					
$M_0 = 0.305 / E_{\rm c}$	(ihit 13-11)				D = (E	xhibit	13-12)			
S - 500 - 1	$(\Box_{i} h) = 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1$				S_= m	nh (Ev	hibit 13-12)			
9 _R - 58.9 mph	i (⊏xniDit 13-11)				S =	P'' (∟∧ nh (⊏·	hibit 12 10)			
5 ₀ = 65.2 mph	(Exhibit 13-11)				C₀− m	hii (⊑x	11101t 13-12)			
S = 61.8 mph	i (Exhibit 13-13)				S= m	ph (Ex	nıbit 13-13)			

RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Info	rmation			Site Infor	mation					
Analyst			Fre	eeway/Dir of Tr	avel	I-95 NE	3			
Agency or Company	AECO	MC	Ju	nction		Seg 5-	Off to Exp f	rom GPL		
Date Performed			Ju	risdiction		÷				
Analysis Time Perio	d AM		An	alysis Year		2040 B	uild 2			
Project Description	SW 10th Stree	t SIMR								
Inputs		¥							-	
Upstream Adj F	Ramp	Freeway Num	nber of Lanes, N	4					Downstrea	am Adj
		Ramp Numbe	er of Lanes, N	1					Ramp	,
Yes 🖸	🗸 On	Acceleration I	Lane Length, L							
		Deceleration	lane Length L	200						
	_] Off	Erooway Volu		7200					🗹 No	Off
	Fleeway volume, v _F								I. =	ft
	950 H	Ramp volume	e, v _R	180					-down	
V = 8'	30 veh/h	Freeway Free	e-Flow Speed, S _{FF}	70.0					V _D =	veh/h
		Ramp Free-F	low Speed, S _{FR}	45.0						
Conversion t	to pc/h Und	der Base	Conditions							
(nc/h)	V	DHE	Terrain	%Truck	%Pv		f	f		xf xf
(pc/ii)	(Veh/hr)		Terrain	70 TTUCK	/0111		'HV	' p	V V/I III	Λ'HV Λ'p
Freeway	7390	0.95	Level	3	0	0.	985	1.00	78	96
Ramp	180	0.92	Level	2	0	0.	990	1.00	19	98
UpStream	830	0.92	Level	2	0	0.	990	1.00	9'	11
DownStream										
		Merge Areas				-		liverge Areas		
Estimation o	t v ₁₂				Estimat	ion o	of V ₁₂			
	V ₁₂ = V _F	(P _{FM})					V ₁₂ =	V _R + (V _F - V	/ _R)P _{FD}	
L _{E0} =	(Equa	ition 13-6 or	13-7)		L _{E0} =			334.82 (Equa	tion 13-12 o	r 13-13)
P=	usina	Equation (Fxhibit 13-6)				0.	436 Jusing Fr	nuation (Exhi	hit 13-7)
тм V=	nc/h				гл V =		35	54 nc/h	quality (Exam	
V or V	po/h	Equation 12	(14 or 12 17)		V_{12}		00	,04 pc/m 74 ma/h /⊏a	unting 10 de	L == 40 47)
$v_3 \circ v_{av34}$	pc/ii (i		-14 01 13-17)		v ₃ 01 v _{av34}	. 0 7	ا∠ ⊐ 00 × م/\0	rr pc/n (∈q	uation 13-14	+0113-17)
IS V_3 or $V_{av34} > 2,70$		s 🗌 No			IS V ₃ or V _{av}	₃₄ > 2,1		Yes Mo)	
Is V_3 or $V_{av34} > 1.5$	* V ₁₂ /2 Yes	s ∐No	40.40.40		Is V ₃ or V _{av}	₃₄ > 1.5	* V ₁₂ /2	Yes VNC)	40 40
If Yes,V _{12a} =	pc/h (13_19)	Equation 13	-16, 13-18, or		If Yes,V _{12a} =	=	p ۱۵	c/h (Equatio	n 13-16, 13-	18, or 13-
Canacity Che	<u>10-10)</u>				Canacit	v Ch	ocks	<i></i>		
	Actual		anacity			<u>y Cir</u>	Actual		`anacity	
	Actual		σαρασιτγ	LUGT	V		7000	Evhibit 12		LUGT
					V _F		7090		-0 9000	INO
V _{FO}		Exhibit 13-8			$V_{FO} = V_{F}$	- V _R	7698	Exhibit 13	-8 9600	No
					V _R		198	Exhibit 13-	10 2100	No
Flow Enterin	g Merge In	fluence A	Area		Flow Er	nterin	g Diver	rge Influe	nce Area	
	Actual	Max	Desirable	Violation?			Actual	Max Desir	able	Violation?
V _{R12}		Exhibit 13-8			V ₁₂	3	3554	Exhibit 13-8	4400:All	No
Level of Serv	vice Detern	nination (if not F)		Level of	f Serv	vice De	terminatio	on (if not	F)
$D_{p} = 5.475 \pm 0$.00734 v _p +	0.0078 V ₄₀	- 0.00627 L			$D_{p} = 4$.252 + 0	.0086 V ₄₀ - (0.009 Lp	/
D = (pc/mi/lr)	$\sum_{R} (no/mi/ln)$						/mi/ln)	12	D	
и со стания	1)				$D_R = 3$	o.u (pc/	(1111/111)			
LUS = (Exhibit	13-2)			LUS = D	(Exnii	olt 13-2)				
Speed Deter	Speed L	Deter	minatic	on						
M _S = (Exibit 1	l _s = (Exibit 13-11)						xhibit 13-	·12)		
S _R = mph (Exl	hibit 13-11)				S _R = 6 ⁻	1.2 mph	(Exhibit	13-12)		
$S_0 = mph (E \times I)$, hibit 13-11)				S ₀ = 72	2.2 mph	(Exhibit	13-12)		
S = mph (Exi	hibit 13-13)				S = 66	5.8 mnh	(Exhibit	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 NB Seg 6-So	outh of Off to 10th
Analysis Time Period	AM		Analysis Year	2040 Bul	ild 2
Project Description Str Toli	I Slieel Slivik		Des (N)	- Pla	nning Data
Flow Inputs			JC3.(IV)		
Volume, V AADT	7210	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 Adjustn	nents				
f _ρ Ε _τ	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 Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured) Base free-flow Speed, BFFS	4 70.0	ft ft ramps/mi mph mph	f _{LW} f _{LC} TRD Adjustment FFS	70.0	mph mph mph mph
LOS and Performance	Measures		Design (N)		
<u>Operational (LOS)</u> v _p = (V or DDHV) / (PHF x N x S D = v _p / S LOS	x f _{HV} x f _p) 1926 63.9 30.1 D	pc/h/ln mph pc/mi/ln	$\frac{\text{Design (N)}}{\text{Design LOS}}$ $v_p = (V \text{ or DDHV}) / (PHF x N x S)$ $D = v_p / S$ Required Number of Lanes, N	f _{HV} x 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	speed e-flow speed	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	.13 2, 11-3	f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

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	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	AECOM		Highway/Direction of Travel From/To Jurisdiction	I-95 NB Seg 8-Be	et Off & Off Ramps
Project Description SW 10th	h Street SIMR			2040 Du	
✓ Oper.(LOS)			Des.(N)	Pla	nning Data
Flow Inputs					_
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D	6020	veh/h veh/day veh/h	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade % Length	0.95 3 0 Level mi	
Calculate Flow Adjustn	nents		Op/Down %		
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	6	
Lane Width Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured) Base free-flow Speed, BFFS	3 70.0	ft ft ramps/mi mph mph	f _{∟w} f _{LC} TRD Adjustment FFS	70.0	mph mph mph mph
LOS and Performance	Measures		Design (N)		
<u>Operational (LOS)</u> v _p = (V or DDHV) / (PHF x N x S D = v _p / S LOS	x f _{HV} x f _p) <i>2144</i> 59.7 35.9 E	pc/h/ln mph pc/mi/ln	$\frac{\text{Design (N)}}{\text{Design LOS}}$ $v_p = (V \text{ or DDHV}) / (PHF x N x S)$ $D = v_p / S$ Required Number of Lanes, N	f _{HV} x 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 ur volume	speed ee-flow speed	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	13 2, 11-3	f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

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RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Infor	rmation			Site Infor	mation					
Analyst			Fr	eeway/Dir of Tr	Travel I-95 NB					
Agency or Company	AEC	OM	Ju	nction		Seg 9-	Off to Hillsb	oro EB&WB		
Date Performed	J 0.14		Ju	risdiction		0040 0				
Project Description	SW/ 10th Stree		AI	lalysis rear		2040 B				
Inputs										
		Freeway Num	ber of Lanes N	3						
Upstream Adj R	lamp	Ramp Numbe	ar of Lanes N	1					Downstrea	am Adj
Yes	On	Accoloration I		I						
			Lane Length L	000					Ves 🗹	🗹 On
No 🗌	Off			200					🗌 No	Off
	4	Freeway volu	ime, v _F	6020					1. =	2100 ft
	L	Ramp Volume	e, V _R	1330					down	2100 10
V = v	eh/h	Freeway Free	e-Flow Speed, S _{FF}	70.0					V _D =	1230 veh/h
	Ramp Free-Flow Speed, S _{FR} 45									
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	6020	0.95	Level	3	0	0.	985	1.00	64	32
Ramp	1330	0.92	Level	2	0	0.	990	1.00	14	60
UpStream										
DownStream	1230	0.92	Level	2	0	0.	990	1.00	13	50
F atimatian at	f	Merge Areas			F ation of		<u> </u>	viverge Areas		
Estimation of	^{r v} 12				Estimat		^{or v} 12			
	V ₁₂ = V _F	(P _{FM})					V ₁₂ =	V _R + (V _F - V	′ _R)P _{FD}	
L _{EQ} =	(Equa	ation 13-6 or	13-7)		L _{EQ} =		(Equation 13-	12 or 13-13)
P _{FM} =	using	Equation (Exhibit 13-6)		P _{FD} =		0.	532 using Ec	uation (Exhi	bit 13-7)
V ₁₂ =	pc/h				V ₁₂ =		41	05 pc/h		
V ₃ or V _{av34}	pc/h (Equation 13	-14 or 13-17)		$V_3^{}$ or $V_{av34}^{}$		23	27 pc/h (Equ	uation 13-14	1 or 13-17)
Is V_3 or $V_{av34} > 2,70$)0 pc/h? 🗌 Ye	s 🗌 No			Is V ₃ or V _{av}	₃₄ > 2,7	00 pc/h?	Yes 🗹 No		
Is V_3 or $V_{av34} > 1.5$	*V ₁₂ /2 🗌 Ye	s 🗌 No			Is V ₃ or V _{av}	3 ₄ > 1.5	* V ₁₂ /2	Yes 🗹 No		
lf Yes,V _{12a} =	pc/h (13_10)	Equation 13	-16, 13-18, or		If Yes,V _{12a} =	=	р 10	c/h (Equation	n 13-16, 13-	-18, or 13-
Canacity Che	rks)			Canacit	v Ch	ecks)		
	Actual		Capacity	LOS F?		<u>, .</u>	Actual	С	apacity	LOS F?
					Vr		6432	Exhibit 13-	8 7200	No
Vro		Exhibit 13-8			$V_{ro} = V_r$	- V_	4972	Exhibit 13	8 7200	No
FO					V	· · · R	1/60	Exhibit 13	10 2100	No
Elow Entering	<u> </u> a Maraa In	fluonoo	1.500			torin				NO
FIOW Entering	Actual	Max	Nesirable	Violation?	FIOW EI		Actual	Max Desira		Violation?
V=	Actual	Exhibit 13-8	Desirable	VIOIATION	Vie		1105	Exhibit 13-8	4400·AII	No
Level of Serv	l vice Deterr	nination ((if not E)			f Sor	vice De	torminatic	n (if not	F)
$D_{-} = 5475 \pm 0$	00734 v - +	0 0078 V	- 0.00627 .			$D_{-} = 4$	252 + 0	0086 V 0	0091	· /
$D_{\rm R} = (n_{\rm C}/m_{\rm I}/m_{\rm I})$	$P_{\rm R} = 0.00027 P_{\rm A}$						/mi/ln)	12	.000 LD	
$D_R = (pc/m/m)$	1) 42.0\				$D_R = 3$	/.o (pc /⊏ь:i	///////			
LUS - (Exhibit	13-2)				LUS - E		Dil 13-2)			
Speed Deterr	nination				Speed L		minatio	0 n 40)		
M _S = (Exibit 1)	3-11)				$u_{s} = 0.$.429 (E	xnidit 13-	12) 12.10)		
S _R = mph (Exh	nibit 13-11)				о _R - 58	5.0 mph	(Exhibit	13-12)		
S ₀ = mph (Exh	nibit 13-11)				$S_0 = 7^2$	1.6 mph	(Exhibit	13-12)		
S = mph (Exh	nibit 13-13)				S = 62	2.3 mph	(Exhibit	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	l-95 NB Seg 10-E	Bet Off & On Ramps
Analysis Time Period	AM		Analysis Year	2040 Bu	ild 2
Project Description SW 10th	n Street SIMR		2 40		
✓ Oper.(LOS)			Jes.(N)		nning Data
	(000			0.05	
Volume, V AADT	4690	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T	0.95 3	
Peak-Hr Prop. of AAD I, 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 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	6	
Lane Width		ft			
Rt-Side Lat. Clearance	0	ft	t _{LW}		mph
Number of Lanes, N	3	romoo/mi	ILC		mpn
FES (measured)	70.0	mnh		70.0	mph
Base free-flow Speed, BFFS	70.0	mph	FFO	70.0	шрп
LOS and Performance I	Measures		Design (N)		
<u>Operational (LOS)</u> v _p = (V or DDHV) / (PHF x N x S D = v _p / S LOS	(f _{HV} x f _p) 1670 67.4 24.8 C	pc/h/ln mph pc/mi/ln	$\frac{\text{Design (N)}}{\text{Design LOS}}$ $v_p = (V \text{ or DDHV}) / (PHF x N x S)$ $D = v_p / S$ Required Number of Lanes, N	f _{HV} x 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 ur volume	speed ee-flow speed	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	-13 2, 11-3	f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

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		F	REEWAY	WEAV	ING WOF	RKSHEE	Г			
Genera	I Informati	on			Site Info	rmation				
Analyst Agency/Co Date Perfor Analysis Tir	mpany rmed me Period	AECON AM	И		Freeway/Dir of TravelI-95 NBWeaving Segment LocationSeg 11-Bet On & Off to ExpAnalysis Year2040 Build 2					
Project Des	scription SW 10t	h Street SIMF	2							
Inputs					•					
Weaving configurationTwo-SidedWeaving number of lanes, N2Weaving segment length, Ls2970fFreeway free-flow speed, FFS70 mpł					J Segment type Freeway minimum speed, S _{MIN} Freeway maximum capacity, C _{IFL} Terrain type					
Conver	sions to po	c/h Unde	r Base Co	ondition	S		I			
	V (veh/h)	PHF	Truck (%)	RV (%)	E _T	E _R	f _{HV}	fp	v (pc/h)	
V _{FF}	3875	0.95	3	0	1.5	1.2	0.985	1.00	4140	
V _{RF}	2165	0.92	2	0	1.5	1.2	0.990	1.00	2377	
V _{FR}	815	0.92	2	0	1.5	1.2	0.990	1.00	895	
V _{RR}	455	0.92	2	0	1.5	1.2	0.990	1.00	500	
V _{NW}	7412							V =	7912	
V _W	500									
VR	0.063									
Config	uration Cha	aracteris	tics		1					
Minimum n	naneuver lanes,	N _{WL}		0 lc	Minimum we	aving lane cl	nanges, LC _{MIN}		1500 lc/h	
Interchang	e density, ID			0.7 int/mi	i Weaving lane changes, LC_w 19					
Minimum F	RF lane changes,	$\mathrm{LC}_{\mathrm{RF}}$		0 lc/pc	Non-weaving	g lane chang	es, LC _{NW}		2728 lc/h	
Minimum F	R lane changes,	$\rm LC_{FR}$		0 lc/pc	Total lane ch	nanges, LC _{ALI}	L		4721 lc/h	
Minimum F	R lane changes	, LC _{RR}		3 lc/pc	Non-weaving	g vehicle inde	ex, I _{NW}		1541	
Weavin	g Segmen	t Speed,	Density, l	_evel of	Service,	and Cap	oacity			
Weaving set Weaving set	Weaving segment flow rate, v 7813 veh/h Weaving segment capacity, c _w 8449 veh/h					ensity factor, gment speed	W , S		0.326 50.1 mph	
Weaving se	egment v/c ratio			0.925	Average wea	aving speed,	S _W		56.5 mph	
Weaving s	egment density,	D	39	9.5 pc/mi/ln	Average nor	n-weaving spo	eed, S _{NW}		49.7 mph	
Level of Se	ervice, LOS			F	Maximum we	eaving length	i, L _{max}		6318 ft	
Notes	ognopte lange 4	hon the select	tod movimenter !-	nath obaula	o trooted as !-	olotod monor	and diverse		propoduros of	
 a. weaving Chapter 13, b. For volum 	"Freeway Merge a	and Diverge Se weaving segr	egments". nent capacity, th	<u>ne level of</u> sei	vice is "F".	orateu merge	anu uiverge ar	eas using the	procedures of	

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	BASIC FRE	EWAY SE	GMENTS WORKSHEE	Г	
General Information			Site Information		
Analyst Agency or Company Date Performed	AECOM		Highway/Direction of Travel From/To	I-95 NB Seg 12-No	rth of Hillsboro
Analysis Time Period	AM		Analysis Year	2040 Build	2
Project Description SW 1	0th Street SIM	R			
✓ Oper.(LOS)			es.(N)	🗌 Plannir	ıg Data
Flow Inputs					
Volume, V AADT	6040	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		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
Speed Inputs			Calc Speed Adj and F	FS	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f, w		mph
Number of Lanes, N	4		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			ľ
LOS and Performanc	e Measures		Design (N)		
Operational (LOS)	N v f		<u>Design (N)</u> Design LOS		
$v_p = (v or DDriv) / (rrin x r) x f_p)$	1613 N 1613	pc/h/ln	v _p = (V or DDHV) / (PHF x t x f)	N x f _{HV}	pc/h/ln
S	68.0	mph	S		mph
$D = v_p / S$	23.7	pc/mi/ln	D = v / S		pc/mi/ln
LOS	С		Required Number of Lanes	, N	P0/111/11
Glossary			Factor Location		
N - Number of lanes	S - Spee	d			
V - Hourly volume	D - Densi	tv	$E_{\rm R}$ - Exhibits 11-10, 11-12		W - EXNIDIT 11-8
v _n - Flow rate	FFS - Free	- -flow speed	$E_{T} = EXINDITS 11-10, 11-11,$	11-13 t _L	
LOS - Level of service speed	BFFS - Ba	se free-flow	LOS, S, FFS, v _p - Exhibits 1	11-2,	ки - Раде 11-11
DDHV - Directional design	hour volume		11-3		

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		F	REEWAY	WEAV	ING WOR	RKSHEE	Г			
Genera	Informatio	on		Site Information						
Analyst Agency/Con Date Perfori Analysis Tin	npany ned ne Period	AECON PM	Λ		Freeway/Dir Weaving Seg Analysis Yea	Freeway/Dir of Travel I-95 NB Weaving Segment Location Seg 1-Bet Copans & Sample Analysis Year 2040 Build 2				
Project Des	cription SW 10th	n Street SIMR								
Inputs					1					
$\begin{array}{llllllllllllllllllllllllllllllllllll$					Segment type Freeway min Freeway max Terrain type	e imum speed, ximum capac	, S _{MIN} ity, C _{IFL}		Freeway 15 2400 Level	
Conver	sions to po	:/h Unde	r Base Co	ondition	S		•		-	
	V (veh/h)	PHF	Truck (%)	RV (%)	Ε _Τ	E _R	f _{HV}	fp	v (pc/h)	
V _{FF}	4355	0.95	3	0	1.5	1.2	0.985	1.00	4653	
V _{RF}	495	0.92	2	0	1.5	1.2	0.990	1.00	543	
V _{FR}	1810	0.92	2	0	1.5	1.2	0.990	1.00	1987	
V _{RR}	0	0.95	0	0	1.5	1.2	1.000	1.00	0	
V _{NW}	4653			•			-	V =	7183	
V _W	2530							-	-	
VR	0.352									
Configu	ration Cha	aracterist	ics		•					
Minimum m	aneuver lanes, N	N _{WL}		2 lc	Minimum we	aving lane cl	nanges, LC _{MIN}		lc/h	
Interchange	density, ID			0.7 int/mi	Weaving lane changes, LC _w Ic					
Minimum R	F lane changes,	LC _{RF}		1 lc/pc	Non-weaving lane changes, LC _{NW} Ic					
Minimum Fl	R lane changes,	LC _{FR}		1 lc/pc	Total lane ch	nanges, LC _{ALI}	L		lc/h	
Minimum R	R lane changes,	LC_{RR}		lc/pc	Non-weaving	g vehicle inde	ex, I _{NW}			
Weavin	g Segment	Speed,	Density, I	_evel of	Service,	and Cap	oacity			
Weaving se Weaving se	Weaving segment flow rate, v7090 veWeaving segment capacity, c6713 ve					ensity factor, gment speed	W , S		mph	
Weaving se	gment v/c ratio	_		1.056	Average wea	aving speed,	S _W		mph	
Weaving se	gment density, [כ		pc/mi/ln	n Average non-weaving speed, S _{NW}				mph	
Level of Se	VICE, LUS			F	Maximum weaving length, L _{MAX} 6151 f					
Notes a. Weaving s Chapter 13, ' b. For volume	egments longer th Freeway Merge a es that exceed the	nan the calcula Ind Diverge Se weaving segr	ted maximum le gments". nent capacity, tł	ength should l	be treated as is vice is "F".	solated merge	and diverge ar	eas using the	procedures of	

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	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst			Highway/Direction of Travel	I-95 NB Sea 2-Be	et Off & On from
Agency or Company	AECOM		From/To	Sample	
Date Performed Analysis Time Period	РМ		Jurisdiction Analysis Year	2040 Bu	ild 2
Project Description SW 10	th Street SIMR				
✓ Oper.(LOS)		Des.(N)	Pla	nning Data
Flow Inputs					
Volume, V	4850	veh/h	Peak-Hour Factor, PHF	0.95	
AADT		veh/day	% Irucks and Buses, P _T	3	
Peak-Hr Prop. of AADT, K			%RVs, P _R	0	
Peak-Hr Direction Prop, D		veh/h	General Terrain: Grade % Length	Level mi	
		Venin	Up/Down %		
Calculate Flow Adjust	ments				
f	1.00			12	
'p F_	1.50		$rac{1}{2}R$ f = 1/(1+P_(E1) + P_(E1))	0.985	
-T Cread Innute	1.0			0.000	
Speed inputs				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)		
			Design (N)		
Operational (LOS)			Design LOS		
$v_p = (V \text{ or DDHV}) / (PHF x N)$	x f _{HV} x f _p) 1727	pc/h/ln	$v_{p} = (V \text{ or DDHV}) / (PHF x N x)$	f _{HV} x f _n)	pc/h/ln
S	66.8	mph	S	11 0 P	mph
$D = v_p / S$	25.9	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 - Sneed				
V - Hourly volume	D - Density		E _R - Exhibits 11-10, 11-12		f _{LW} - Exhibit 11-8
v - Flow rate	FFS - Free-flow	speed	E _T - Exhibits 11-10, 11-11, 11	-13	f _{LC} - Exhibit 11-9
I OS - Level of service	BEES - Base fre	e-flow speed	f _p - Page 11-18		TRD - Page 11-11
DDHV - Directional design he	our volume	ie new opoou	LOS, S, FFS, v _p - Exhibits 11-	2, 11-3	

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Job: SW 10th Street SIMR Analyst: AECOM



<u>No. Ln</u>	Capacity Check (see Exhibits 25-3 and 25-7):	Maximum	Actual	V/c	LOS F?
4	Fwy downstream of ramp (assume 70 mph free-flow speed) =	9,600	6,400	0.67	No
3	Fwy upstream of ramp (assume 70 mph free-flow speed) =	7,200	5,182	0.72	No
1	Capacity on On-Ramp (assume 45 mph free-flow speed) =	2,100	1,212	0.58	No

RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Infor	mation			Site Infor	mation					
Analyst			Fr	eeway/Dir of Tra	ravel I-95 NB					
Agency or Company	AEC	MC	Ju	Inction		Seg 4	-On from Ex	¢ρ		
Date Performed			Ju	irisdiction						
Analysis Time Period	M PM		Ar	nalysis Year		2040	Build 2			
Project Description	SW 10th Stree	t SIMR								
inputs										
Upstream Adj Ramp		Freeway Num	iber of Lanes, N	4					Downstrea	am Adj
		Ramp Numbe	r of Lanes, N	anes, N 1 Ramp						
Yes Or	1	Acceleration L	ane Length, L _A	1500					✓ Yes	🗆 On
	f	Deceleration I	Lane Length L _D							
	1	Freeway Volu	me, V _r	5990					L NO	MOΠ
L _{up} = ft		Ramp Volume	e. V _D	670					L _{down} =	2950 ft
чр 		Freeway Free	-Flow Speed S	70.0						
V _u = veh/h		Ramp Free Fl	low Speed S	F0.0					V _D =	310 veh/h
	<u> / - </u>		ow Speed, S _{FR}	50.0						
Conversion to			Conditions	1	r	-				
(pc/h)	(Veh/hr)	PHF	Terrain	%Truck	%Rv		f _{HV}	f _p	v = V/PHF	x f _{HV} x f _p
Freeway	5990	0.95	Level	3	0).985	1.00	6	400
Ramp	670	0.92	Level	2	0).990	1.00	7	36
UpStream										
DownStream	310	0.92	Level	2	0	().990	1.00	(r.)	40
		Merge Areas		-			[Diverge Areas		
Estimation of	^f v ₁₂				Estimation of v ₁₂					
	$V_{12} = V_{E}$	(P _{EM})					V -			
	(Fau	ation 13-6 ດ	r 13-7)				v ₁₂ =	v _R + (v _F - v _R)P _{FD}	
P =	0 126	using Equat	tion (Exhibit 13-6)		L _{EQ} =			(Equation 13-	12 or 13-1	3)
· •M V =	0.120 905 p	o/b			P _{FD} =			using Equatio	n (Exhibit 13	-7)
* 12 ⁻	000 P	u/li co/b /Equati	on 12 11 or 12		V ₁₂ =			pc/h		
V ₃ or V _{av34}	17)	oc/ii (Equali	01113-14 01 13-		$V_3^{}$ or $V_{av34}^{}$			pc/h (Equation 1	3-14 or 13-1	7)
Is V_3 or $V_{av34} > 2,70$, 0 pc/h? √ Ye	s 🗌 No			Is V_3 or V_{av}	₃₄ > 2,	700 pc/h?	Yes 🗌 No		
Is V_2 or $V_{a_124} > 1.5$	* V ₁₀ /2 Ve	s 🗌 No			Is V_3 or V_{av}	₃₄ > 1.	5 * V ₁₂ /2	Yes No		
5 av54	2560	oc/h (Equati	on 13-16. 13-		If Yes V ₄₀ =	=		pc/h (Equation	n 13-16, 13	8-18, or
if Yes,V _{12a} =	18, or	13-19)	,				1	3-19)		
Capacity Che	ecks				Capacit	y Ch	necks			
	Actual	0	Capacity	LOS F?			Actual	Cap	pacity	LOS F?
					V _F			Exhibit 13-8	3	
V	7136	Evhihit 13-8		No	$V_{EO} = V_{E}$	- V_		Exhibit 13-8	3	
[♥] FO	7150			NU		<u> </u>		Exhibit 13-	-	
					v _R			10		
Flow Entering	g Merge In	fluence A	lrea		Flow En	nterii	ng Dive	rge Influen	ce Area	
	Actual	Max	Desirable	Violation?			Actual	Max Desi	rable	Violation?
V _{R12}	3603	Exhibit 13-8	4600:All	No	V ₁₂			Exhibit 13-8		
Level of Serv	ice Detern	nination (if not F)		Level of	f Ser	vice De	terminatio	n (if not	F)
$D_{p} = 5.475 + 0.00734 v_{p} + 0.0078 V_{12} - 0.00627 L_{A}$						D _R =	4.252 + 0	.0086 V ₁₂ - 0.	.009 L _D	
D _R = 25.4 (pc/m	ii/ln)				D _R = (r	oc/mi/	′ln)		2	
OS = C (Exhibit)	, 13-2)				10S = (F	=xhibi	, it 13-2)			
Speed Detern	nination				Speed [Doto	rminatio	<u></u>		
					$D = \pi$	Jele Ivhihit	13 10)	///		
M _S = 0.314 (Exi	bit 13-11)				ν _s – (Ε		10-12)			
S _R = 61.2 mph ((Exhibit 13-11)				o _R - m	ipn (Ex	andit 13-12)			
S ₀ = 65.8 mph ((Exhibit 13-11)				S₀= m	iph (Ex	(nibit 13-12)			
S = 63.3 mph ((Exhibit 13-13)				S= m	iph (Ex	(hibit 13-13)			

		RAMP	S AND RAM	P JUNCTI	ONS WO	RKS	HEET			
General Infor	rmation			Site Infor	mation					
Analyst			Fre	eeway/Dir of Tr	Travel I-95 NB					
Agency or Company	AEC	MC	Ju	nction		Seg 5-	Off to Exp f	rom GPL		
Date Performed			Ju	risdiction		•				
Analysis Time Perio	d AM		An	alysis Year		2040 B	uild 2			
Project Description	SW 10th Stree	t SIMR								
Inputs		¥								
Upstream Adj F	Ramp	Freeway Num	nber of Lanes, N	4					Downstrea	am Adj
	•	Ramp Numbe	er of Lanes, N	1					Ramp	,
Yes 🖸	🗹 On	Acceleration I	Lane Length, L							
		Deceleration	lane Length L	200						
	_] Off	Eroowov Volu		200					🗹 No	Off
	050 ft		ine, v _F	0000					I. =	ft
L _up − _ 28	950 IL	Ramp Volume	e, V _R	310					down	
V = 67	70 veh/h	Freeway Free	e-Flow Speed, S _{FF}	70.0					V _D =	veh/h
	ven/n	Ramp Free-F	low Speed, S _{FR}	45.0						
Conversion t	to pc/h Und	der Base	Conditions							
(no/h)	V		Torrain	% Truck	0/ Dv		f	f		vfvf
(pc/li)	(Veh/hr)	ГШ	Terrain	/011UCK	70INV		'HV	'p	v – v/i i ii	∧'HV ^'p
Freeway	6660	0.95	Level	3	0	0.	985	1.00	71	16
Ramp	310	0.92	Level	2	0	0.	990	1.00	34	40
UpStream	670	0.92	Level	2	0	0.	990	1.00	7	36
DownStream										
	-	Merge Areas			Diverge Areas					
Estimation of	f v ₁₂				Estimat	ion o	of v ₁₂			
	V ₁₂ = V _F	(P _{EM})					V ₁₂ =	V _R + (V _F - \	/ _B)P _{ED}	
	(Equa	tion 13-6 or	13-7)				35	24.43 (Equa	tion 13-12 c	or 13-13)
-EQ P =		Equation (Evhibit 13_6		-EQ P =		0.	136 using E	auation (Evhi	hit 13 7)
'FM	using				FD		0.0	+50 using L		bit 13-7)
v ₁₂ -	pc/n				v ₁₂ -		32	94 pc/n		
v ₃ or v _{av34}	pc/h (Equation 13	3-14 or 13-17)		v ₃ or v _{av34}		19	011 pc/h (Eq	uation 13-14	4 or 13-17)
Is V_3 or $V_{av34} > 2,70$	00 pc/h? 🗌 Ye	s 🗌 No			Is V ₃ or V _{av}	₃₄ > 2,7	00 pc/h?	Yes 🗹 No)	
Is V_3 or $V_{av34} > 1.5$	* V ₁₂ /2	s 🗌 No			Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ Yes No					
If Yes,V ₁₂₂ =	pc/h (Equation 13	8-16, 13-18, or		If Yes,V ₁₂₀ =	=	р	c/h (Equatio	n 13-16, 13	-18, or 13-
	13-19)						1	9)		
Capacity Cne		1			Capacity Checks					
	Actual		Capacity	LOS F?	<u> </u>		Actual	(apacity	LOS F?
					V _F		7116	Exhibit 13	-8 9600	No
V _{FO}		Exhibit 13-8			$V_{FO} = V_{F}$	- V _R	6776	Exhibit 13	-8 9600	No
					V _R		340	Exhibit 13-	10 2100	No
Flow Enterin	a Merae In	fluence A	rea		Flow En	terin	a Dive	rae Influe	nce Area	8
	Actual	Max	Desirable	Violation?			Actual	Max Desira	able	Violation?
Varia		Exhibit 13-8			Via		3294	Exhibit 13-8	4400·All	No
V _{R12} Exhibit 13-0						<u> </u>	vice De	torminati	n (if not)
					Lever					r)
$D_{R} = 5.475 + 0.00734 v_{R} + 0.0078 V_{12} - 0.00627 L_{A}$						$D_{R} = 2$	1.252 + 0	.0086 v ₁₂ - (0.009 L _D	
$D_R = (pc/mi/ln)$ $D_R = 30.8 (pc/mi/ln)$										
LOS = (Exhibit	13-2)				LOS = D	(Exhil	oit 13-2)			
Speed Deterr		Speed L	Deter	minatic	n					
M _o = (Exibit 1		D _s = 0.	329 (E	xhibit 13-	12)					
$S = mnh (Ev)^{1}$					S _P = 60).8 mnh	(Exhibit	, 13-12)		
					к ос S.= 73	20 mnh	(Evhibit	13_12)		
$S_0 = mpn (Ext)$	11DIT 13-11)							10-12)		
p = mpn (Exr	iidit 13-13)				S = 66	b.9 mph	(Exhibit	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 NB Seg 6-S	outh of Off to 10th
Analysis Time Period	PM		Analysis Year	2040 Bu	110 2
Project Description 307 70					anning Data
)		Jes.(N)		anning Data
Volume, V AADT	6350	veh/h veh/dav	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 Adjust	ments				
f _p Ε _τ	1.00 1.5		E _R f _{HV} = 1/[1+P _T (E _T - 1) + P _P (E _P - 1)]	1.2 0.985	
Speed Inputs			Calc Speed Adi and FFS	5	
Lane Width Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured) Base free-flow Speed, BFFS	4 70.0	ft ft ramps/mi mph mph	f _{LW} f _{LC} TRD Adjustment FFS	70.0	mph mph mph mph
LOS and Performance	Measures	-	Design (N)		
<u>Operational (LOS)</u> v _p = (V or DDHV) / (PHF x N S D = v _p / S LOS	x f _{HV} x f _p) 1696 67.1 25.3 C	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	f _{HV} x 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 he	S - Speed D - Density FFS - Free-flow BFFS - Base fre	speed ee-flow speed	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	.13 2, 11-3	f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

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	BASIC FRE	EEWAY SE		Г	
General Information			Site Information		
Analyst Agency or Company Date Performed	AECOM		Highway/Direction of Travel From/To	I-95 NB Seg 8-Bet Of	f & Off Ramps
Analysis Time Period	PM		Analysis Year	2040 Build 2	
Project Description SW 1	0th Street SIM	R			
Oper.(LOS)			es.(N)	Planning	Data
Flow Inputs					
Volume, V AADT	5080	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		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$] <i>0.9</i> 85	
Speed Inputs			Calc Speed Adj and F	FS	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f.w		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 Performanc	e Measures		Design (N)		
Operational (LOS)			<u>Design (N)</u> Design LOS		
x f _p)	^{N X I} HV 1809	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f)	N x f _{HV}	pc/h/ln
S	65.7	mph	s		mph
D = v _p / S	27.5	pc/mi/ln	D = v / S		nc/mi/ln
LOS	D		Required Number of Lanes,	, N	P0/111/11
Glossary			Factor Location		
N - Number of lanes	S - Spee	d	E Exhibite 11 10 11 10	£	
V - Hourly volume	D - Densi	ty	$E_{\rm R}$ - Exhibits 11-10, 11-12	^I LW	- EXHIDIL 11-0
v _n - Flow rate	FFS - Free	- flow speed	$E_{T} = EXIIIDILS + 1 - 10, + 1 - 11, + 1 + 10, + 1 - 11, + 10, $		
LOS - Level of service speed	BFFS - Ba	se free-flow	LOS, S, FFS, v _p - Exhibits 1	1 RI 11-2,	J - Page 11-11
DDHV - Directional design	hour volume		11-3		

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	RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Infor	rmation			Site Infor	mation					
Analyst			Fr	eeway/Dir of Tr	Fravel I-95 NB					
Agency or Company	AEC	OM	Ju	nction		Seg 9-	Off to Hillsb	oro EB&WB		
Date Performed			Ju	risdiction		0040 0				
Project Description	SW 10th Stree		AI	lalysis real		2040 B				
Inputs										
		Freeway Num	ber of Lanes N	3						
Upstream Adj H	Ramp	Ramp Numbe	ar of Lanes N	1					Downstrea	am Adj
Yes	On		and Longth	I						
			Lane Length, L _A	000					Ves 🗹	✓ On
I No □	Off	200					🗆 No	Off		
	-	Freeway Volu	ime, V _F	5080						2100 ft
	π	Ramp Volum	e, V _R	1320					└down ─	2100 11
V = v	eh/h	Freeway Free	e-Flow Speed, S _{FF}	70.0					V _D =	1440 veh/h
vu v	CH/H	Ramp Free-F	low Speed, S _{FR}	45.0						
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	5080	0.95	Level	3	0	0.	985	1.00	54	28
Ramp	1320	0.92	Level	2	0	0.	990	1.00	14	49
UpStream										
DownStream	1440	0.92	Level	2	0	0.	990	1.00	15	581
	-	Merge Areas			-			iverge Areas		
Estimation of	t v ₁₂				Estimat	ion o	of v ₁₂			
	V ₁₂ = V _F	(P _{FM})					V ₁₂ =	V _R + (V _F - V	/ _R)P _{FD}	
L _{EQ} =	(Equa	ation 13-6 or	13-7)		L _{EQ} =		(Equation 13-	12 or 13-13	5)
P _{FM} =	using	Equation (Exhibit 13-6)		P _{FD} =		0.	558 using Ed	quation (Exh	ibit 13-7)
V ₁₂ =	pc/h				V ₁₂ =		36	68 pc/h		
V_3 or V_{av34}	pc/h (Equation 13	-14 or 13-17)		V_3 or V_{av34}		17	60 pc/h (Eq.	uation 13-14	4 or 13-17)
Is V_3 or $V_{3\sqrt{34}} > 2,70$	00 pc/h? 🗌 Ye	s 🗌 No			Is V ₃ or V _{2V}	34 > 2,7	00 pc/h?	∏Yes I No		,
Is V_3 or $V_{av34} > 1.5$	*V ₁₂ /2 Ye	s 🗌 No			Is V ₃ or V _{2V}	⊶ ₃₄ > 1.5	* V ₁₂ /2	Yes 🗸 No		
If Yes V ₄₀ =	pc/h (Equation 13	-16, 13-18, or		If Yes V ₄₀ =	:	p	c/h (Equatio	n 13-16, 13	-18, or 13-
	13-19))				- <u>_</u>	19	9)		
Capacity Che	PCKS		Non o site :		Capacit	y Ch	ecks			
	Actual		Japacity	LUSF?	V		Actual			LUSF?
					V _F		5428	EXHIDIC 13	-0 7200	INO
V _{FO}		Exhibit 13-8			$V_{FO} = V_{F}$	- v _R	3979	Exhibit 13	-8 7200	No
					V _R		1449	Exhibit 13-	10 2100	No
Flow Entering	g Merge In	fluence A	Area	1	Flow En	terin	g Dive	rge Influer	nce Area	
	Actual	Max	Desirable	Violation?			Actual	Max Desira	able	Violation?
V _{R12}		Exhibit 13-8			V ₁₂		3668	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of	f Serv	vice De	terminatio	on (if not	F)
$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$						D _R = 4	1.252 + 0	.0086 V ₁₂ - 0	0.009 L _D	
D _R = (pc/mi/ln) D _R = 34.0 (pc/mi/ln)										
LOS = (Exhibit	LOS = (Exhibit 13-2) LOS = D (Exhibit 13-2)									
Speed Determination					Speed L	Deter	minatic	n		
M _s = (Exibit 1	3-11)				D _s = 0.428 (Exhibit 13-12)					
S _R = mph (Exh	nibit 13-11)				S _R = 58	3.0 mph	(Exhibit	13-12)		
$S_0 = mph (Ext)$, nibit 13-11)				S ₀ = 73	3.8 mph	(Exhibit	13-12)		
S = mph (Exh	nibit 13-13)				S = 62	2.3 mph	(Exhibit	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 NB Seg 10-l	Bet Off & Off Ramps
Analysis Time Period	PM		Analysis Year	2040 Bu	ila 2
					unning Data
Flow Inputs)		Jes.(N)		In Initing Data
Volume, V AADT	3760	veh/h veh/dav	Peak-Hour Factor, PHF %Trucks and Buses. P-	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	ments				
f _p E₊	1.00 1.5		$E_{R} = \frac{1}{[1 + P_{T}(E_{T} - 1) + P_{D}(E_{D} - 1)]}$	1.2 0.985	
Speed Inputs	-		Calc Speed Adi and FFS	3	
Lane Width Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured) Base free-flow Speed, BFFS	3 70.0	ft ft ramps/mi mph mph	f _{LW} f _{LC} TRD Adjustment FFS	70.0	mph mph mph mph
LOS and Performance	Measures		Design (N)		
<u>Operational (LOS)</u> v _p = (V or DDHV) / (PHF x N S D = v _p / S LOS	x f _{HV} x f _p) 1339 69.8 19.2 C	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	f _{HV} x 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 pur volume	speed ee-flow speed	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-	-13 2, 11-3	f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

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		F	REEWAY	WEAV	ING WOF	RKSHEE	Т			
Genera	I Informati	on			Site Info	rmation				
Analyst Agency/Co Date Perfo Analysis Ti	mpany rmed me Period	AECON PM	И		Freeway/Dir of Travel I-95 NB Weaving Segment Location Seg 11-Bet On & Off to Exp Analysis Year 2040 Build 2					
Project Des	scription SW 10t	h Street SIMF	2							
Inputs					•					
Weaving co Weaving n Weaving se Freeway fre	onfiguration umber of lanes, N egment length, L ee-flow speed, Fl	N S FS		Two-Sided 4 2970ft 70 mph	Segment typ Freeway min Freeway ma: Terrain type	e imum speed ximum capac	, S _{MIN} sity, C _{IFL}		Freeway 15 2400 Leve	
Conver	rsions to po	c/h Unde	r Base Co	ondition	S		•	Ĩ.		
	V (veh/h)	PHF	Truck (%)	RV (%)	E _T	E _R	f _{HV}	fp	v (pc/h)	
V _{FF}	3160	0.95	3	0	1.5	1.2	0.985	1.00	3376	
V _{RF}	2420	0.92	2	0	1.5	1.2	0.990	1.00	2657	
V _{FR}	600	0.92	2	0	1.5	1.2	0.990	1.00	659	
V _{RR}	460	0.92	2	0	1.5	1.2	0.990	1.00	505	
V _{NW}	6692			-			-	V =	7197	
V _W	505							-		
VR	0.070									
Config	uration Cha	aracterist	tics		•					
Minimum r	maneuver lanes,	N _{WL}		0 lc	Minimum we	aving lane c	hanges, LC _{MIN}	I	1515 lc/h	
Interchang	e density, ID			0.7 int/mi	Weaving lan	e changes, L	-C _W		2008 lc/h	
Minimum F	RF lane changes,	$\mathrm{LC}_{\mathrm{RF}}$		0 lc/pc	Non-weaving	g lane chang	es, LC _{NW}		2353 lc/h	
Minimum F	R lane changes,	$\rm LC_{FR}$		0 lc/pc	Total lane ch	nanges, LC _{AL}	L		4361 lc/h	
Minimum F	RR lane changes	, LC _{rr}		3 lc/pc	Non-weaving	g vehicle inde	ex, I _{NW}		1391	
Weavin	ig Segmen	t Speed,	Density, I	_evel of	Service,	and Cap	oacity			
Weaving segment flow rate, v7109 veh/hWeaving segment capacity, cw8430 veh/h					Weaving inte Weaving sec	ensity factor, gment speed	W , S		0.306 50.9 mph	
Weaving s	egment v/c ratio			0.843	Average wea	aving speed,	S _W		57.1 mph	
Weaving s	egment density,	D	35	5.4 pc/mi/ln	Average nor	n-weaving sp	eed, S _{NW}		50.5 mph	
Level of Se	ervice, LOS			E	Maximum we	eaving length	η, L _{MAX}		6384 ft	
Notes								·		
a. vveaving Chapter 13, b. For volum	segments longer to "Freeway Merge and that exceed the	nan the calcula and Diverge Se <u>e weaving s</u> egr	ated maximum le egments". ment capacity, th	ength should l <u>ne level of</u> sei	be treated as is vice is "F".	solated merge	and diverge ar	eas using the	procedures of	

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	BASIC FRE	EWAY SEC		Г	
General Information			Site Information		
Analyst Agency or Company Date Performed	AECOM		Highway/Direction of Travel From/To	I-95 NB Seg 12-Norti	h of Hillsboro
Analysis Time Period	PM		Analysis Year	2040 Build 2	,
Project Description SW 1	0th Street SIMI	7			
Oper.(LOS)		D	es.(N)	Planning) Data
Flow Inputs					
Volume, V AADT	5580	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T	0.95 3	
Peak-Hr Prop. of AADT, K			%RVs, P _R	0	
Peak-Hr Direction Prop, D			General Terrain:	Level	
DDHV = AADT x K x D		veh/h	Grade % Length	mi	
			Up/Down %		
Calculate Flow Adjus	tments				
f _p	1.00		E _R	1.2	
Ε _T	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$] <i>0.985</i>	
Speed Inputs			Calc Speed Adj and F	FS	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f		mph
Number of Lanes, N	4		fue		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed,		mph		70.0	mpn
BFFS		mpri			
LOS and Performance	e Measures		Design (N)		
Operational (LOS)			<u>Design (N)</u>		
$v_{x} = (V \text{ or } DDHV) / (PHF x)$	N X funz		Design LOS		
x f_)	^{HV} 1490	pc/h/ln	v _p = (V or DDHV) / (PHF x N	N x f _{HV}	pc/h/ln
s	69.0	mph	x f _p)		P
$D = v_p / S$	21.6	pc/mi/ln	S		mph
LOS	С	1	$D = v_p / S$		pc/mi/ln
			Required Number of Lanes,	, N	
Glossary			Factor Location		
N - Number of lanes	S - Speed	b	F ₋ - Exhibits 11-10 11-12	f	- Exhibit 11-8
V - Hourly volume	D - Densi	ty	$E_{\rm R}$ = Exhibits 11-10, 11-11	'LW 11_13 f	- Exhibit 11-9
v _p - Flow rate	FFS - Free	-flow speed	f - Page 11-18		D - Page 11 11
LOS - Level of service	BFFS - Bas	se free-flow	LOS, S, FFS, v _x - Exhibits 1	۲۳ 11-2,	и - гауе 11-11
DDHV - Directional design l	nour volume		11-3	-	

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	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 1-B 2040 Bu	et Hillsboro & Palmetto iild 2
Project Description SW 10th	h Street SIMR		,		
Oper.(LOS)			Des.(N)	Pla	anning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D	4820	veh/h veh/day veh/h	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade % Length	0.95 3 0 Level mi	
Calculate Flow Adjustr	nents		Up/Down %		
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	6	
Lane Width Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured) Base free-flow Speed, BFFS	4 70.0	ft ft ramps/mi mph mph	f _{LW} f _{LC} TRD Adjustment FFS	70.0	mph mph mph mph
LOS and Performance	Measures		Design (N)		
<u>Operational (LOS)</u> v _p = (V or DDHV) / (PHF x N : S D = v _p / S LOS	x f _{HV} x f _p) 1287 69.9 18.4 C	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	f _{HV} x 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 free our volume	speed ee-flow speed	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-	-13 2, 11-3	f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

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		F	REEWAY	WEAV	NG WOF	RKSHEE	Г		
Genera	I Informati	on			Site Info	rmation			
Analyst Agency/Co Date Perfor Analysis Tir	mpany rmed me Period	AECON AM	И		Freeway/Dir Weaving Seç Analysis Yea	of Travel gment Locatio	195/S on Seg 2 2040	B 2-Bet On from Build 2	Exp & Off
Project Des	scription SW 10t	h Street SIMF	2						
Inputs									
Weaving co Weaving nu Weaving se Freeway fre	onfiguration umber of lanes, N egment length, L ee-flow speed, Fl	N s FS		Two-Sided 4 3900ft 70 mph	d 4 Freeway minimum speed, S _{MIN} Freeway maximum capacity, C _{IFL}				
Conver	sions to po	c/h Unde	r Base Co	ondition	S		I	1	-
	V (veh/h)	PHF	Truck (%)	RV (%)	E _T	E _R	f _{HV}	fp	v (pc/h)
V _{FF}	3525	0.95	3	0	1.5	1.2	0.985	1.00	3766
V _{RF}	1065	0.92	2	0	1.5	1.2	0.990	1.00	1169
V _{FR}	1295	0.92	2	0	1.5	1.2	0.990	1.00	1422
V _{RR}	125	0.92	2	0	1.5	1.2	0.990	1.00	137
V _{NW}	6357							V =	6494
V _W	137								
VR	0.021								
Configu	uration Cha	aracteris	tics		•				
Minimum n	naneuver lanes,	N _{WL}		0 lc	Minimum we	aving lane cl	nanges, LC _{MIN}		411 lc/h
Interchang	e density, ID			0.7 int/mi	Weaving lan	e changes, L	.C _w		983 lc/h
Minimum F	RF lane changes,	$\mathrm{LC}_{\mathrm{RF}}$		0 lc/pc	Non-weaving	g lane chang	es, LC _{NW}		2957 lc/h
Minimum F	R lane changes,	$\rm LC_{FR}$		0 lc/pc	Total lane ch	nanges, LC _{ALI}	L		3940 lc/h
Minimum F	R lane changes	, LC _{RR}		3 lc/pc	Non-weaving	g vehicle inde	ex, I _{NW}		1735
Weavin	g Segmen	t Speed,	Density, I	_evel of	Service,	and Cap	oacity		
Weaving segment flow rate, v6412 veh/hWeaving segment capacity, c8847 veh/h					Weaving intensity factor, W Weaving segment speed, S 5				0.228 59.3 mph
Weaving s	egment v/c ratio	-		0.725	Average wea	aving speed,	S _W		59.8 mpn
Weaving s	egment density,	D	27	/.4 pc/mi/ln	Average nor	i-weaving sp	eed, S _{NW}		59.2 mph
Level of Se	ervice, LUS			C	Maximum we	eaving length	i, L _{max}		5923 ft
Notes a. Weaving : Chapter 13, b. For volum	segments longer t "Freeway Merge a les that exceed the	han the calcula and Diverge Se e weaving segr	ited maximum le gments". ment capacity, th	ength should l	be treated as is vice is "F".	solated merge	and diverge ar	eas using the	procedures of

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BASIC FREEWAY SEGMENTS WORKSHEET									
General Information			Site Information						
Analyst Agency or Company Date Performed	AECOM	Highway/Direction of Travel From/To Jurisdiction		I-95 SB Seg 3-Be	et Off & On Ramp				
Analysis Time Period	AM		Analysis Year	2040 Bu	ild 2				
Project Description SW Tuth	Street SIMR				nning Data				
Flow Inputs			Jes.(N)						
Volume, V AADT	4590	veh/h veh/dav	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 Adjustm	nents								
f _p	1.00		E _R	1.2					
Ε _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	6					
Lane Width Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured)	3 70.0	ft ft ramps/mi mph	f _{∟w} f _{LC} TRD Adjustment FFS	70.0	mph mph mph mph				
Base free-flow Speed, BFFS		mpn							
Derational (LOS) $v_p = (V \text{ or DDHV}) / (PHF x N x)$ S D = v_p / S LOS	x f _{HV} x f _p) 1635 67.8 24.1 C	pc/h/ln mph pc/mi/ln	Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF x N x)$ S $D = v_p / S$ Required Number of Lanes, N	f _{HV} x 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 ur volume	speed ee-flow speed	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-	.13 2, 11-3	f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11				

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	RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Infor	rmation			Site Infor	mation						
Analyst			Fr	eeway/Dir of Tr	ravel I-95 SB						
Agency or Company	AEC	OM	Ju	inction		Seg 4-I	Diverge to	SW 10th St			
Date Performed			Ju	risdiction		0040 0	1.1.0				
Project Description	U AIVI		Aľ	alysis rear		2040 B					
Innuts											
mputs		Freeway Num	her of Lanes N	3							
Upstream Adj F	Ramp	Ramo Numbe	ar of Lanes N	1					Downstre	am Adj	
Yes	On			I							
		Acceleration	Lane Length, L _A						Ves 🗹	🗹 On	
I No □	Off	Deceleration		200					🗌 No	Off	
	5 4	Freeway Volu	ime, V _F	4590					. =	2400 ft	
	π	Ramp Volume	e, V _R	1350					-down	2400 IL	
V = v	eh/h	Freeway Free	e-Flow Speed, S _{FF}	70.0					V _D =	1600 veh/h	
[•] u •	01/11	Ramp Free-F	low Speed, S _{FR}	45.0							
Conversion t	o pc/h Un	der Base	Conditions	2							
(pc/h) V PHF Terrain %Truck			%Truck	%Rv		f _{HV}	f _p	v = V/PHF	⁻ x f _{HV} x f _p		
Freeway	4590	0.95	Level	3	0	0.	985	1.00	4	904	
Ramp	1350	0.92	Level	2	0	0.	990	1.00	1.	482	
UpStream											
DownStream	1600	0.92	Level	2	0	0.	990	1.00	1	757	
		Merge Areas						iverge Areas			
Estimation of	f v ₁₂				Estimat	ion o	of v ₁₂				
	V ₁₂ = V _F	(P _{FM})					V ₁₂ =	V _R + (V _F - V	/ _R)P _{FD}		
L _{EQ} =	(Equa	ition 13-6 or	13-7)		L _{EQ} =		(Equation 13	-12 or 13-13	3)	
P _{FM} =	using	Equation (I	Exhibit 13-6)		P _{FD} =		0.	569 using E	quation (Exh	ibit 13-7)	
V ₁₂ =	pc/h				V ₁₂ =		34	30 pc/h			
V_3 or V_{av34}	pc/h (Equation 13	-14 or 13-17)		V_3 or V_{av34}		14	74 pc/h (Eq	uation 13-1	4 or 13-17)	
Is V_3 or $V_{3\sqrt{34}} > 2,70$	00 pc/h? 🗌 Ye	s 🗌 No			Is V ₃ or V ₃	₃₄ > 2,7	00 pc/h? [Yes √No)	,	
Is V_3 or $V_{av34} > 1.5$	* V ₁₂ /2 Ye	s 🗌 No			Is V ₂ or V ₂	_{عم} > 1.5	* V ₁₂ /2 □	Yes Vo)		
	pc/h (Equation 13	-16, 13-18, or			-	12 E	c/h (Equatio	n 13-16, 13	-18, or 13-	
11 1 es, v _{12a} -	13-19)				11 1 CS, V _{12a}		19	9)			
Capacity Che	ecks	1			Capacit	y Ch	ecks				
	Actual		Japacity	LOS F?			Actual	(apacity	LOS F?	
					V _F		4904	Exhibit 13	-8 7200	No	
V _{FO}		Exhibit 13-8			$V_{FO} = V_{F}$	- V _R	3422	Exhibit 13	-8 7200	No	
					V _R		1482	Exhibit 13-	10 2100	No	
Flow Entering	g Merge In	fluence A	lrea		Flow Er	nterin	g Dive	rge Influe	nce Area		
	Actual	Max	Desirable	Violation?		/	Actual	Max Desir	able	Violation?	
V _{R12}		Exhibit 13-8			V ₁₂	3	3430	Exhibit 13-8	4400:All	No	
Level of Serv	vice Detern	nination (if not F)		Level of	f Serv	vice De	terminatio	on (if not	<i>F</i>)	
D _R = 5.475 + 0	.00734 v _R +	0.0078 V ₁₂ ·	- 0.00627 L _A			D _R = 4	1.252 + 0	.0086 V ₁₂ - (0.009 L _D		
D _R = (pc/mi/ln)					D _R = 32	2.0 (pc	/mi/ln)				
LOS = (Exhibit	13-2)				LOS = D	(Exhil	oit 13-2)				
Speed Deterr	Speed Determination					Deter	minatic	on			
M _s = (Exibit 1	I₅ = (Exibit 13-11)				D _s = 0.	431 (E	xhibit 13-	·12)			
S _R = mph (Ext	, nibit 13-11)				S _R = 5	7.9 mph	(Exhibit	13-12)			
$S_0 = mph (Ext)$, nibit 13-11)				S ₀ = 74	4.9 mph	(Exhibit	13-12)			
S = mph (Exh	, nibit 13-13)				S = 62	2.2 mph	(Exhibit	13-13)			
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BASIC FREEWAY SEGMENTS WORKSHEET									
General Information			Site Information						
Analyst Agency or Company Date Performed	AECOM	Highway/Direction of Trave From/To Jurisdiction		l-95 SB Seg 5-Be	et Off & On Ramps				
Analysis Time Period	AM		Analysis Year	2040 Bu	ild 2				
Project Description SW 10th	n Street SIMR				nning Data				
Flow Inputs			Jes.(N)						
Volume, V AADT	3240	veh/h veh/dav	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 Adjustn	nents								
f _p	1.00		E _R	1.2					
Ε _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	6					
Lane Width Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured)	3 70.0	ft ft ramps/mi mph	f _{∟w} f _{LC} TRD Adjustment FFS	70.0	mph mph mph mph				
Base free-flow Speed, BFFS		mpn							
Derational (LOS) v _p = (V or DDHV) / (PHF x N x S D = v _p / S LOS	K f _{HV} x f _p) 1154 70.0 16.5 B	pc/h/ln mph pc/mi/ln	Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF x N x)$ S $D = v_p / S$ Required Number of Lanes, N	f _{HV} x 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 ur volume	speed ee-flow speed	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-	13 2, 11-3	f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11				

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RAMPS AND RAMP JUNCTIONS WORKSHEET											
Genera	l Infor	mation			Site Infor	mation					
Analyst Agency or Date Perfor	Company rmed	AEC	MC	Fı Jı Jı	reeway/Dir of Tra unction urisdiction	avel	I-95 S Seg 6	B -Merge from	Hillsboro E&W		
Analysis Ti	me Period	AM		A	nalysis Year		2040 I	Build 2			
Project Des	scription	SW 10th Stree	t SIMR								
Inputs											
Upstream A	Adj Ramp		Freeway Num Ramp Numbe	ber of Lanes, N	3 1					Downstrea Ramp	ım Adj
🗹 Yes	On		Acceleration L	ane Length, L _A	300					Yes	🗌 On
🗌 No	✓ Off	:	Deceleration I Freeway Volu	_ane Length L _D	3240					🗹 No	Off
L _{up} =	2400	ft	Ramp Volume	1600					L _{down} =	ft	
V _u =	1350 v	reh/h	Freeway Free Ramp Free-Fl	-Flow Speed, S _{FF}	70.0 50.0					V _D =	veh/h
Conver	rsion to	nc/h Un	der Base	Conditions							
		V V		- ·				,	,		
(pc)	/h)	(Veh/hr)	PHF	Terrain	%Truck	%Rv		f _{HV}	f _p	v = V/PHF	x f _{HV} x f _p
Pamp		3240	0.95	Level	3 2	0		0.900	1.00		+0Z 757
LinStream		1250	0.92	Level	2	0		0.990	1.00	1.	101
DownStream	eam 1350 0.92 Level				2	0		0.990	1.00	14	+02
Downouled	am		Merge Areas			Diverge Areas					
Estima	tion of	v ₁₂				Estimation of v ₁₂					
		V ₁₂ = V _F	(P _{FM})					V40 = 1	Vn + (Vr - Vn		
L _{EQ} =		1463.07	(Equation	13-6 or 13-7)		I =		• 12	Faulation 13	.12 or 13₋1'	3)
P _{FM} =		0.586	using Equat	ion (Exhibit 13-6)	EQ D -			Light Equation	-12 01 10-10	7)
$V_{12} =$		2028	oc/h			FD -			using Equatio		-7)
V_3 or $V_{3\sqrt{24}}$		1434	pc/h (Equati	on 13-14 or 13-		$v_{12} = V_2$ or V_{22}		I	oc/n oc/h (Equation 1	3-14 or 13-17	7)
Is V ₃ or V _a	_{av34} > 2,70	0 pc/h? 🗌 Ye	s 🗹 No			Is V ₃ or V _{av}	, ₃₄ > 2,	700 pc/h?	_Yes		,
Is V_3 or V_a	_{av34} > 1.5 *	V ₁₂ /2 Ve	s 🗌 No			Is $V_3^{}$ or $V_{av}^{}$	₃₄ > 1.	5 * V ₁₂ /2	Yes 🗌 No		
lf Yes,V _{12a}	=	2028 18 or	pc/h (Equati 13-19)	on 13-16, 13-		lf Yes,V _{12a} =	=	 1:	oc/h (Equatio 3-19)	n 13-16, 13	8-18, or
Capaci	ty Che	cks				Capacit	y Ch	necks			
	-	Actual	C	apacity	LOS F?			Actual	Ca	pacity	LOS F?
						V _F			Exhibit 13-	8	
V _F	=O	5219	Exhibit 13-8		No	V _{FO} = V _F	- V _R		Exhibit 13-	8	
						V _R			Exhibit 13 10	-	
Flow E	ntering	n Merge In	fluence A	rea		Flow Er	nterii	ng Dive	rge Influen	ice Area	
		Actual	Max	Desirable	Violation?		_	Actual	Max Des	irable	Violation?
V _R	12	3785	Exhibit 13-8	4600:All	No	V ₁₂			Exhibit 13-8		
Level o	of Serv	ice Detern	nination (if not F)		Level of	f Ser	vice De	terminatio	n (if not	F)
D _R	= 5.475 +	0.00734 v _R + (0.0078 V ₁₂ - 0.0	00627 L _A			D _R =	4.252 + 0	.0086 V ₁₂ - 0	.009 L _D	
D _R = 3	32.3 (pc/m	i/ln)				D _R = (oc/mi/	ln)			
LOS = D	D (Exhibit	13-2)				LOS = (I	Exhibi	it 13-2)			
Speed	Detern	nination				Speed L	Deter	rminatic	on		
M _S = C	0.463 (Exit	oit 13-11)				D _s = (E	Exhibit	13-12)			
S _R = 5	57.0 mph (Exhibit 13-11)				S _R = m	iph (Ex	hibit 13-12)			
S ₀ = 6	66.6 mph (Exhibit 13-11)				S ₀ = m	iph (Ex	hibit 13-12)			
S = 5	59.4 mph (Exhibit 13-13)				S= m	iph (Ex	hibit 13-13)			

BASIC FREEWAY SEGMENTS 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 On Ramps				
Analysis Time Period	AM h Street SIMP		Analysis Year	2040 BU	11a 2				
Oper (LOS)			Des (N)	Pla	nning Data				
Flow Inputs			500.(17)						
Volume, V AADT	4840	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 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					
Speed Inputs			Calc Speed Adj and FFS	6					
Lane Width Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured)	3 70.0	ft ft ramps/mi mph	f _{∟w} f _{∟C} TRD Adjustment FFS	70.0	mph mph mph 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 x S D = v _p / S LOS	x f _{HV} x f _p) 1724 66.8 25.8 C	pc/h/ln mph pc/mi/ln	$\frac{\text{Design (N)}}{\text{Design LOS}}$ $v_p = (V \text{ or DDHV}) / (PHF x N x)$ S $D = v_p / S$ Required Number of Lanes, N	f _{HV} x 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 free our volume	speed ee-flow speed	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	13 2, 11-3	f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11				

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Job: SW 10th Street SIMR Analyst: AECOM

Location: Analysis Period:	Seg 8: I- AM Peak	eg 8: I-95 Southbound On-Ramp from SW 10th Street EB & M Peak Hour									
Analysis Year:	2040 Bui	40 Build 2									
4,840			→ 6,030								
						\rightarrow					
1.190											
.,		2	8								
	PHF =	0.95									
	v _{fr} =	6,030	vph								
	v _r =	1,190	vph								
	v _f =	4,840									
Upstream Freeway	Tr % =	3%									
Ramp	Tr % =	2%									
Downstream Freeway	Tr % =	3%									
Freeway	f _{HV} =	1/(1+P	r(E _T -1)+P _R (E _R -	1)) =	0.985						
Ramp	f _{HV} =	1/(1+P	_r (E _⊤ -1)+P _R (E _R -	1)) =	0.9901						
flat terrain	Ε _τ =	1.5									
	RV % =	0									
Driver Population adj.	f _P =	1.000									
	V _{fr} =	=v _{fr} /(PH	HF)(f _{H∨})(f _P) =	6,443	pc/h						
	V _r =	=v _r /(PH	IF)(f _{H∨})(f _P) =	1,265	pc/h						
	V, =	=v./(PH	$ F\rangle(f_{\mu\nu})(f_{P}) =$	5.171	pc/h						
No. lanes upstream of ramp	N =	3		•,	F 8/11						

<u>No. Ln</u>	Capacity Check (see Exhibits 25-3 and 25-7):	Maximum	Actual	V/c	LOS F?
4	Fwy downstream of ramp (assume 70 mph free-flow speed) =	9,600	6,443	0.67	No
3	Fwy upstream of ramp (assume 70 mph free-flow speed) =	7,200	5,171	0.72	No
1	Capacity on On-Ramp (assume 45 mph free-flow speed) =	2,100	1,265	0.60	No

	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed	AECOM	Highway/Direction of Trave From/To Jurisdiction		I-95 SB Seg 9-Be	et 10th & Exit to Exp
Analysis Time Period	AM Street SIMP		Analysis Year	2040 Bu	lia 2
				- Pla	nning Data
Flow Inputs			500.(11)		
Volume, V AADT	6030	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 Adjustn	nents				
f _p	1.00		E _R	1.2	
Ε _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	6	
Lane Width Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured)	4 70.0	ft ft ramps/mi mph	f _{∟w} f _{LC} TRD Adjustment FFS	70.0	mph mph mph mph
LOS and Porformance	Moasuros	шрп	Dosign (N)		
$\frac{\text{Operational (LOS)}}{v_p = (V \text{ or DDHV}) / (PHF x N x)}$ S D = v_p / S LOS	(f _{HV} × f _p) 1611 68.0 23.7 C	pc/h/ln mph pc/mi/ln	$\frac{\text{Design (N)}}{\text{Design LOS}}$ $v_p = (V \text{ or DDHV}) / (PHF x N x S)$ $D = v_p / S$ Required Number of Lanes, N	f _{HV} x 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 ur volume	speed ee-flow speed	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	.13 2, 11-3	f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

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RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Infor	mation			Site Infor	mation					
Analyst			Fr	eeway/Dir of Tra	avel	I-95 S	B			
Agency or Company	AECO	MC	Ju	nction		Seg 1	0-Merge fro	m Ex to GP		
Date Performed			Ju	risdiction		•	Ū			
Analysis Time Period	MA b		An	alysis Year		2040	Build 2			
Project Description	SW 10th Stree	t SIMR								
Inputs										
LInstream Adi Ramp		Freeway Num	ber of Lanes, N	4					Downstre	am Adi
		Ramp Numbe	r of Lanes, N	1					Ramp	
🗌 Yes 🛛 🗌 Or	ı	Acceleration I	ane Length L	600						
		Deceloration	and Longth L	000					Yes	□ On
🗹 No 📃 Of	f								🗌 No	✓ Off
		Freeway Volume, V _F 6030								1150 8
$L_{up} = \pi$		Ramp Volume	e, V _R	300					└down [—]	1150 11
		Freeway Free	-Flow Speed, S _{FF}	70.0					V_ =	780 veh/h
v _u – ven/n		Ramp Free-Fl	ow Speed, S _{FR}	50.0					•D	
Conversion t	o pc/h Und	der Base	Conditions							
(nc/h)	V	PHF	Terrain	%Truck	%Rv		f	f	v = V/PHF	x fx f
(po/ii)	(Veh/hr)			7011401	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		·HV	.p		ну к тр
Freeway	6030	0.95	Level	3	0).985	1.00	6	443
Ramp	300	0.92	Level	2	0).990	1.00	3	329
UpStream	700	0.00					000	4.00		50
DownStream 780 0.92 Level				2	0		J.990		<u> </u>	350
Estimation of	Fiz	werge Areas			Ectimat	ion		Jiverge Areas		
	$V_{12} = V_{F}$	(P _{FM})					V ₁₂ =	Vp + (Vr - Vp		
L _{EQ} =	(Equa	ation 13-6 o	r 13-7)		=		12	(Equation 13-	.12 or 13_1	3)
P _{FM} =	0.177	using Equat	ion (Exhibit 13-6)		EQ P =			using Equation	n /Evhibit 13	(7)
V ₁₂ =	1138	oc/h			FD					-1)
	2652	oc/h (Equati	on 13-14 or 13-		v ₁₂ –			pc/n		
v ₃ or v _{av34}	17)				v ₃ or v _{av34}	_		pc/h (Equation 1	13-14 or 13-1	()
Is V ₃ or V _{av34} > 2,70	0 pc/h? 🗌 Ye	s 🗹 No			Is V ₃ or V _{av}	₃₄ > 2,	700 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 * V ₁₂ /2	Yes No		
If Yes V =	2577	pc/h (Equati	on 13-16, 13-		If Yes,V _{12a} =	=	1	pc/h (Equation	n 13-16, 13	3-18, or
11 103, v _{12a}	18, or	13-19)			120		1.	3-19)		
Capacity Che	cks				Capacit	y Ch	necks			
	Actual		Capacity	LOS F?			Actual	Car	pacity	LOS F?
					V _F			Exhibit 13-8	8	
Vro	6772	Exhibit 13-8		No	$V_{FO} = V_{F}$	- V _R		Exhibit 13-8	8	
FO					V			Exhibit 13	-	
					۲R			10		
Flow Entering	g Merge In	fluence A	rea	n	Flow En	<u>iterii</u>	ng Dive	rge Influen	ice Area	
	Actual	Max	Desirable	Violation?		_	Actual	Max Desi	irable	Violation?
V _{R12}	2906	Exhibit 13-8	4600:All	No	V ₁₂			Exhibit 13-8		
Level of Serv	ice Detern	nination (if not F)		Level of	f Ser	vice De	terminatio	n (if not	F)
D _R = 5.475 +	0.00734 v _R + 0	0.0078 V ₁₂ - 0.	00627 L _A			D _R =	4.252 + 0	.0086 V ₁₂ - 0.	.009 L _D	
D _R = 24.2 (pc/m	ii/ln)				D _R = (p	oc/mi/	′ln)			
LOS = C (Exhibit	13-2)				LOS = (E	Exhibi	it 13-2)			
Speed Detern	nination				Speed [Dete	rminatio	n		
					$D = / \Box$	xhihit	13-12)			
vi _S – 0.332 (Exil	ut 13-11)					nh /=	(hibit 12 10)			
⊃ _R = 60.7 mph ((Exhibit 13-11)				∼R [−] "	pii(⊏X	$\frac{101113-12}{1011101101}$			
S ₀ = 64.8 mph ((Exhibit 13-11)				S₀= m	pn (Ex	(nibit 13-12)			
S = 63.0 mph ((Exhibit 13-13)				S= m	ph (Ex	(hibit 13-13)			

	RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Infor	rmation			Site Infor	mation						
Analyst			Fre	eeway/Dir of Tr	ravel I-95 SB						
Agency or Company	AECO	MC	Ju	nction		Seg 11	- Diverge to	o Express			
Date Performed			Ju	risdiction		•	-				
Analysis Time Perio	d AM		An	alysis Year		2040 B	uild 2				
Project Description	SW 10th Stree	t SIMR									
Inputs		¥							-		
Upstream Adj R	Ramp	Freeway Num	nber of Lanes, N	4					Downstrea	am Adj	
		Ramp Numbe	er of Lanes, N	1					Ramp	,	
Yes 🖸	∕ On	Acceleration I	Lane Length, L								
		Deceleration	lane Length L	200							
No L	_ Off	Erooway Volu		6330					🗹 No	Off	
- 11	150 ft		ine, v _F	000					I. =	ft	
	150 11	Ramp Volume	e, v _R	780					down		
V = 30)() veh/h	Freeway Free	e-Flow Speed, S _{FF}	70.0					V _D =	veh/h	
		Ramp Free-F	low Speed, S _{FR}	45.0							
Conversion t	o pc/h Und	der Base	Conditions								
(nc/h)	V	DHE	Terrain	%Truck	%Pv		f	f		xf xf	
(pc/ii)	(Veh/hr)		Terrain	70 TTUCK	/0111		'HV	'p	V V/I III	Λ'HV Λ'p	
Freeway	6330	0.95	Level	3	0	0.	985	1.00	67	63	
Ramp	780	0.92	Level	2	0	0.	990	1.00	8	56	
UpStream	300	0.92	Level	2	0	0.	990	1.00	32	29	
DownStream											
	I	Merge Areas				-		liverge Areas			
Estimation of	t v ₁₂				Estimat	ion o	^t v ₁₂				
	V ₁₂ = V _F	(P _{FM})					V ₁₂ =	V _R + (V _F - V	/ _R)P _{FD}		
	(Equa	tion 13-6 or	13-7)		L _{E0} =		(Equation 13	-12 or 13-13)	
P =	usina	Equation (Fxhibit 13-6)				0,	436 Jusina Fr	nuation (Exhi	, hit 13-7)	
	nc/h						0. 2/	21 no/h			
^v 12	pc/n	Faultion 12) 11 ar 10 17)		$^{\circ}12$		J4	or po/n ∞oo/lu /⊏			
^v ₃ 01 ^v _{av34}			-14 01 13-17)		v ₃ 01 v _{av34}			∞ pc/n (Eq	uation 13-14	FOF 13-17)	
IS V_3 or $V_{av34} > 2,70$		s 🗌 No			IS V ₃ OF V _{av}	₃₄ > 2,7		Yes 🗹 No)		
Is V_3 or $V_{av34} > 1.5$	* V ₁₂ /2 Yes	s 🗌 No			Is V ₃ or V _{av}	₃₄ > 1.5	* V ₁₂ /2	Yes 🗹 No)		
lf Yes,V _{12a} =	pc/h (13 10)	Equation 13	3-16, 13-18, or		If Yes,V _{12a} =	=	p 10	c/h (Equatio	n 13-16, 13-	18, or 13-	
Canacity Cho	10-19)				Canacit	v Ch	ocks	9)			
	Actual		2000 city		T	y Cii	Actual		`onooitr		
	Actual			LUGF?	V		Actual				
					V _F		6763	EXHIDIL IS	-0 9000	INO	
V _{FO}		Exhibit 13-8			$V_{FO} = V_{F}$	- V _R	5907	Exhibit 13	-8 9600	No	
					V _R		856	Exhibit 13	10 2100	No	
Flow Enterin	g Merge In	fluence A	Area		Flow En	terin	g Dive	rge Influe	nce Area		
	Actual	Max	Desirable	Violation?			Actual	Max Desir	able	Violation?	
V _{R12}		Exhibit 13-8			V ₁₂		3431	Exhibit 13-8	4400:All	No	
Level of Serv	, vice Detern	nination ((if not F)		Level of	f Serv	vice De	terminatio	on (if not	<u>.</u> F)	
$D_{-} = 5475 \pm 0$	00734 v - + 0	0 0078 V	- 0.00627 .			$D_{-} = 4$	1252 ± 0	0086 V (0091	/	
$D = (n \alpha/m)/m$	N R R R	12	CICCCLI LA		D - 24	-R	/	12			
$D_R = (pc/m/m)$					D _R = 34	i.9 (pc	/mi/in)				
LOS = (Exhibit	13-2)				LOS = D	(Exhil	oit 13-2)				
Speed Deterr	Speed Determination						minatic	n			
M _S = (Exibit 1	<i>I</i> ₅ = (Exibit 13-11)					375 (E	xhibit 13-	12)			
$S_{p} = mnh (Ext)$	nibit 13-11)				S _R = 59	9.5 mph	(Exhibit	13-12)			
	nibit 13_11)				S ₀ = 74	1.9 mph	(Exhibit	13-12)			
S = mnh (Evt)	nibit 13-13)				S = 65	54 mnh	(Evhihit	, 13_13)			
	hy of Florida All D	ights Posserved				λ. τηρη Λ. τ. τ		10 10)	Generated: (5/15/2020 1.00	
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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		l-95 SB Seg 13-l	Bet Off & On Ramps
Analysis Time Period	AM		Analysis Year	2040 Bu	ild 2
Project Description SW 10	n Street SIMR				
✓ Oper.(LOS))		Jes.(N)		inning Data
	(= (0				
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 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	f		mph
Number of Lanes N	.3	IL	ILW		mph
Total Ramp Density, TRD	Ū	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)		
<u>Operational (LOS)</u> v _p = (V or DDHV) / (PHF x N S D = v _p / S LOS	x f _{HV} x f _p) 1617 68.0 23.8 C	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	f _{HV} x 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 he	S - Speed D - Density FFS - Free-flow BFFS - Base fre pur volume	speed ee-flow speed	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	13 2, 11-3	f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

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			FREEWA	Y WEAV	ING WOF	RKSHEE	Т		
Genera	al Informati	on			Site Info	ormation			
Analyst Agency/Company AECOM Date Performed Analysis Time Period AM					Freeway/Dir of Travel I-95 SB Weaving Segment Location Seg 14- Bet Sample & Copans Analysis Year 2040 Build 2				
Project De	scription SW 10t	h Street SIM	२						
Inputs					1				
Weaving c Weaving n Weaving s Freeway fr	onfiguration umber of lanes, I egment length, L ee-flow speed, F	N s FS		One-Sided 4 2520ft 70 mph	Segment typ Freeway mir Freeway ma Terrain type	e iimum speed ximum capac	, S _{MIN} sity, C _{IFL}		Freewa 1 240 Leve
Conve	rsions to p	c/h Unde	r Base Co	ondition	s			1	-
	V (veh/h)	PHF	Truck (%)	RV (%)	Ε _Τ	E _R	f _{HV}	fp	v (pc/h)
V _{FF}	3810	0.95	3	0	1.5	1.2	0.985	1.00	4071
V _{RF}	1980	0.92	2	0	1.5	1.2	0.990	1.00	2174
V _{FR}	730	0.92	2	0	1.5	1.2	0.990	1.00	801
V _{RR}	0	0.95	0	0	1.5	1.2	1.000	1.00	0
V _{NW}	4071			-			-	V =	7046
V _w	2975								
VR	0.422								
Config	uration Cha	aracteris	tics		•				
Minimum r	maneuver lanes,	N _{WL}		2 lc	Minimum we	eaving lane c	hanges, LC _{MIN}	I	lc/ł
Interchang	je density, ID			0.7 int/mi	Weaving lan	ie changes, L	-C _w		lc/ł
Minimum I	RF lane changes	, LC _{RF}		1 lc/pc	Non-weaving	g lane chang	es, LC _{NW}		lc/ł
Minimum I	FR lane changes	, LC _{FR}		1 lc/pc	Total lane cl	nanges, LC _{AL}	L		lc/ł
Minimum I	RR lane changes	, LC _{RR}		lc/pc	Non-weavin	g vehicle inde	ex, I _{NW}		
Weavir	ng Segmen	t Speed,	Density,	Level of	Service,	and Cap	oacity		
Weaving s	segment flow rate	, V		6957 veh/h	Weaving inte	ensity factor,	W		
Weaving s	segment capacity	, c _w		5600 veh/h	Weaving see	gment speed	, S		mpł
Weaving s	egment v/c ratio			1.242	Average we	aving speed,	S _w		mpł
Weaving segment density, D pc/mi				pc/mi/ln	/In Average non-weaving speed, S _{NW}				mpł
Level of S	Level of Service, LOS				Maximum weaving length, L _{MAX} 6932 ft				
Notes									
a. Weaving Chapter 13	segments longer t	han the calculation of the calcu	ated maximum le	ength should l	be treated as is	solated merge	and diverge ar	eas 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 FREEWAY SEGMENTS 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 1-B 2040 Bi	et Hillsboro & Palmetto					
Project Description SW 10	th Street SIMR			2010 00						
✓ Oper.(LOS)		Des.(N)	Pla	anning Data					
Flow Inputs	,				5					
Volume, V AADT Peak-Hr Prop. of AADT, K	5000	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R	0.95 3 0						
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 Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured) Base free-flow Speed, BEES	4 70.0	ft ft ramps/mi mph mph	f _{LW} f _{LC} TRD Adjustment FFS	70.0	mph mph mph mph					
LOS and Performance	Measures		Design (N)							
<u>Operational (LOS)</u> $v_p = (V \text{ or DDHV}) / (PHF x N)$ S D = v_p / S LOS	x f _{HV} x f _p) 1336 69.8 19.1 C	pc/h/ln mph pc/mi/ln	$\frac{\text{Design (N)}}{\text{Design LOS}}$ $v_p = (V \text{ or DDHV}) / (PHF x N x S)$ $D = v_p / S$ Required Number of Lanes, N	f _{HV} x 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 he	S - Speed D - Density FFS - Free-flow BFFS - Base fre our volume	speed ee-flow speed	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	.13 2, 11-3	f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11					

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		F	REEWAY	WEAV	ING WOF	RKSHEE	Т				
Genera	Informati	on			Site Info	rmation					
Analyst Agency/Cor Date Perfor Analysis Tir	Analyst Agency/Company AECOM Date Performed Analysis Time Period PM					Freeway/Dir of TravelI95/SBWeaving Segment LocationSeg 2-Bet On from Exp & OffAnalysis Year2040 Build 2					
Project Des	cription SW 10t	h Street SIMF	2								
Inputs											
Weaving configurationTwo-SideWeaving number of lanes, NWeaving segment length, Ls3900Freeway free-flow speed, FFS70 mp				Two-Sided 4 3900ft 70 mph	Segment typ Freeway min Freeway ma: Terrain type	e imum speed ximum capac	, S _{MIN} :ity, C _{IFL}		Freeway 15 2400 Level		
Conver	sions to po	c/h Unde	r Base Co	ondition	s	1			-		
	V (veh/h)	PHF	Truck (%)	RV (%)	E _T	E _R	f _{HV}	fp	v (pc/h)		
V _{FF}	3835	0.95	3	0	1.5	1.2	0.985	1.00	4097		
V _{RF}	1135	0.92	2	0	1.5	1.2	0.990	1.00	1246		
V _{FR}	1165	0.92	2	0	1.5	1.2	0.990	1.00	1279		
V _{RR}	95	0.92	2	0	1.5	1.2	0.990	1.00	104		
V _{NW}	6622							V =	6726		
V _W	104										
VR	0.015										
Configu	ration Cha	aracteris	tics								
Minimum m	aneuver lanes,	N _{WL}		0 lc	Minimum we	eaving lane cl	hanges, LC _{MIN}	1	312 lc/h		
Interchange	e density, ID			0.7 int/mi	i Weaving lane changes, LC _w 884 l						
Minimum R	F lane changes,	LC_{RF}		0 lc/pc	Non-weaving lane changes, LC _{NW} 3065						
Minimum F	R lane changes,	$\rm LC_{FR}$		0 lc/pc	Total lane ch	nanges, LC _{AL}	L		3949 lc/h		
Minimum R	R lane changes	, LC _{RR}		3 lc/pc	Non-weaving	g vehicle inde	ex, I _{NW}		1808		
Weavin	g Segmen	t Speed,	Density, I	_evel of	Service,	and Cap	oacity				
Weaving segment flow rate, v6641 veh/hWeaving segment capacity, cw8863 veh/h				6641 veh/h 8863 veh/h	Weaving inte Weaving sec	ensity factor, gment speed	W , S		0.228 59.7 mph		
Weaving segment v/c ratio 0.74				0.749	9 Average weaving speed, S _w 59						
Weaving segment density, D 28.2 pc/mi/				3.2 pc/mi/ln	/In Average non-weaving speed, S_{NW} 59.7 r						
Level of Se	IVICE, LUS			D	Maximum weaving length, L _{MAX} 5870 ft						
Notes	egments longer t	han the colouis	ted maximum la	and the should be	he treated as is	colated moras	and divorge or	and using the	procedures of		
Chapter 13, b. For volum	Freeway Merge a	and Diverge Se	egments". ment capacity, th	<u>ne level of sei</u>	rvice is <u>"F".</u>						

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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
Project Description SW 10	th Street SIMR			2040 Би	110 2
Qper (LOS)		Des (N)	Pla	anning Data
Flow Inputs	/	·			
Volume, V AADT Peak Hr Prop. of AADT. K	4970	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs_P	0.95 3	
Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	General Terrain: Grade % Length Up/Down %	u Level mi	
Calculate Flow Adjust	ments				
f _ρ Ε _Τ	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	6	
Lane Width Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured) Base free-flow Speed, BFFS	3 70.0	ft ft ramps/mi mph mph	f _{∟w} f _{LC} TRD Adjustment FFS	70.0	mph mph mph mph
LOS and Performance	Measures		Design (N)		
<u>Operational (LOS)</u> v _p = (V or DDHV) / (PHF x N S D = v _p / S LOS	x f _{HV} x f _p) 1770 66.2 26.7 D	pc/h/ln mph pc/mi/ln	$\frac{\text{Design (N)}}{\text{Design LOS}}$ $v_p = (V \text{ or DDHV}) / (PHF x N x)$ S $D = v_p / S$ Required Number of Lanes, N	f _{HV} x 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 fre our volume	speed ee-flow speed	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	.13 2, 11-3	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	RKS	HEET			
General Info	rmation			Site Infor	mation					
Analyst			Fr	eeway/Dir of Tr	avel	I-95 SE	3			
Agency or Company	AEC	OM	Ju	inction		Seg 4-I	Diverge to	SW 10th St		
Date Performed	d DM		Ju	risdiction		2040 0				
Project Description	SW 10th Stree		AI	alysis teal		2040 D				
Inputs										
		Freeway Num	ber of Lanes N	3						
Upstream Adj F	Ramp	Ramn Numbe	of Lanes N	1					Downstre	am Adj
Yes	On		ano Longth L	I						_
		Deceleration	Lane Length, L _A	200					Ves 🗹	l On
I I No □	Off			200					🗆 No	Off
	4	Freeway Volu	ime, v _F	4970					. =	2400 ft
∟ _{up} −	IL	Ramp Volume	e, V _R	1020					⁻down	2400 IL
V =	/eh/h	Freeway Free	e-Flow Speed, S _{FF}	70.0					V _D =	1690 veh/h
u		Ramp Free-F	low Speed, S _{FR}	45.0						
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	4970	0.95	Level	3	0	0.	985	1.00	5	310
Ramp	1020	0.92	Level	2	0	0.	990	1.00	1	120
UpStream										
DownStream	1690	0.92	Level	2	0	0.	990	1.00	1	855
	-	Merge Areas				-		iverge Areas		
Estimation o	f v ₁₂				Estimat	ion o	of v ₁₂			
	V ₁₂ = V _F	(P _{FM})					V ₁₂ =	V _R + (V _F - V	√ _R)P _{FD}	
L _{EQ} =	(Equa	ation 13-6 or	13-7)		L _{EQ} =		(Equation 13	-12 or 13-13	3)
P _{FM} =	using	Equation (Exhibit 13-6)		P _{FD} =		0.	576 using E	quation (Exh	ibit 13-7)
V ₁₂ =	pc/h				V ₁₂ =		35	532 pc/h		
V_3 or V_{av34}	pc/h (Equation 13	-14 or 13-17)		V_3 or V_{av34}		17	78 pc/h (Eq	uation 13-1	4 or 13-17)
Is V_3 or $V_{av34} > 2,70$	00 pc/h? 🗌 Ye	s 🗌 No			Is V ₃ or V ₃	₃₄ > 2,7	00 pc/h? [Yes √No)	,
Is V_3 or $V_{av34} > 1.5$	* V ₁₂ /2 Ye	s 🗌 No			Is V ₃ or V ₃	_{عم} > 1.5	* V ₁₂ /2 □	Yes Vo)	
	pc/h (Equation 13	-16, 13-18, or			-	12 E	c/h (Equatio	n 13-16, 13	-18, or 13-
11 1 03, V _{12a} -	13-19))			11 1 C3, V 12a		- 19	9)		
Capacity Che	ecks	1			Capacit	y Ch	ecks			
	Actual		Capacity	LOS F?			Actual	(Capacity	LOS F?
					V _F		5310	Exhibit 13	-8 7200	No
V _{FO}		Exhibit 13-8			$V_{FO} = V_{F}$	- V _R	4190	Exhibit 13	-8 7200	No
					V _R		1120	Exhibit 13	-10 2100	No
Flow Enterin	g Merge In	fluence A	Area		Flow Er	nterin	g Dive	rge Influe	nce Area	
	Actual	Max	Desirable	Violation?		/	Actual	Max Desir	able	Violation?
V _{R12}		Exhibit 13-8			V ₁₂	3	3532	Exhibit 13-8	4400:All	No
Level of Serv	vice Detern	nination (ïf not F)		Level of	f Serv	vice De	terminati	on (if not	F)
D _R = 5.475 + 0	.00734 v _R +	0.0078 V ₁₂ ·	- 0.00627 L _A			D _R = 4	1.252 + 0	.0086 V ₁₂ - (0.009 L _D	
D _R = (pc/mi/ln)					D _R = 32	2.8 (pc	/mi/ln)			
LOS = (Exhibit 13-2)					LOS = D	(Exhil	oit 13-2)			
Speed Deter	mination				Speed L	Deter	minatic	on		
M _s = (Exibit 1	3-11)				D _s = 0.	.399 (E	xhibit 13-	·12)		
$S_{p} = mnh (Fxl)$, hibit 13-11)				S _R = 58	8.8 mph	(Exhibit	13-12)		
$S_0 = mnh (Fxl)$	hibit 13-11)				S ₀ = 73	3.8 mph	(Exhibit	13-12)		
S = mph (Exi	hibit 13-13)				S = 6.	3.1 mph	(Exhibit	, 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 5-Be	et Off & On Ramps
Analysis Time Period	PM		Analysis Year	2040 BU	110 2
					nning Data
Flow Inputs	1		Des.(III)		
Volume, V AADT	3950	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	ments				
f _p E _∓	1.00 1.5		E_{R} f _{1,1/} = 1/[1+P_{T}(E_{T} - 1) + P_{0}(E_{R} - 1)]	1.2 0.985	
Speed Inputs	-		Calc Speed Adi and FFS	3	
Lane Width Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured) Base free-flow Speed, BFFS	3 70.0	ft ft ramps/mi mph mph	f _{LW} f _{LC} TRD Adjustment FFS	70.0	mph mph mph mph
LOS and Performance	Measures		Design (N)		
<u>Operational (LOS)</u> v _p = (V or DDHV) / (PHF x N S D = v _p / S LOS	x f _{HV} x f _p) 1407 69.5 20.2 C	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	f _{HV} x 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	speed ee-flow speed	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-	-13 2, 11-3	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				
Genera	l Infor	mation			Site Infor	mation					
Analyst Agency or Date Perfor	Company rmed	AEC	ОМ	Fı Jı Jı	reeway/Dir of Tra unction urisdiction	avel	I-95 S Seg 6	B -Merge from	Hillsboro E&W		
Analysis Ti	me Period	PM		A	nalysis Year		2040	Build 2			
Project Des	scription	SW 10th Stree	t SIMR								
Inputs											
Upstream A	Adj Ramp		Freeway Num Ramp Numbe	ber of Lanes, N	3 1					Downstrea Ramp	ım Adj
🗹 Yes	On		Acceleration L	ane Length, L _A	300					Yes	🗌 On
🗌 No	✓ Off		Deceleration Lane Length L _D							🗹 No	Off
L _{up} =	2400	ft	Ramp Volume	e, V _R	1690					L _{down} =	ft
V _u =	1020 v	reh/h	Freeway Free Ramp Free-Fl	-Flow Speed, S _{FF} ow Speed, S _{FP}	70.0 50.0					V _D =	veh/h
Conver	rsion to	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		3950	0.95	Level	3	0	0).985	1.00	4	220
Ramp		1690	0.92	Level	2	0	0).990	1.00	18	355
UpStream		1020	0.92	Level	2	0	C).990	1.00	1	120
DownStrea	am										
			Merge Areas			Diverge Areas					
Estima	tion of	v ₁₂				Estimat	tion o	of v ₁₂			
		$V_{12} = V_{F}$	(P _{EM})					V - Y		٥.	
L _{EO} =		1646.25	6 (Fouation	13-6 or 13-7)		_		v ₁₂ –	v _R + (v _F - v _R		
P =		0.586	using Equat	ion (Exhibit 13-6))	L _{EQ} =		(Equation 13-	12 or 13-1	3)
Г FM V=		2/172	nc/h)	P _{FD} =		ı	using Equatio	on (Exhibit 13	-7)
* 12		17/18	pc/h pc/h (Equati	on 13-14 or 13-	_	V ₁₂ =		I	oc/h		
V ₃ or V _{av34}	> 2 70	1740 17) 0 pc/b2 🗆 V o		01110-14 01 10-	-	V_3 or V_{av34} Is V_3 or V_{av34}	, ₃₄ > 2,	700 pc/h? [pc/h (Equation 1 □Yes □ No	13-14 or 13-17	7)
le V or V	1v34 - 2,70 > 1 5 *					Is V ₂ or V	. ₂₄ > 1.	5 * V₁₀/2 [Yes No		
If Yes,V _{12a}	=	2472	pc/h (Equation	on 13-16, 13-		If Yes,V _{12a} =	=	12 – 13	oc/h (Equatio 3-19)	n 13-16, 13	3-18, or
Canaci	ty Che	10, 01	13-19)			Canacit		necks	,		
	ty one	Actual		anacity	LOS F2		.y on	Actual	Car	nacity	LOS F2
		710100	Ĭ	Jupuolity	20011	V_		7101000	Exhibit 13-	8	2001.
V _F	-0	6075	Exhibit 13-8		No	V _{FO} = V _F	- V _R		Exhibit 13-	8	
	-					V _R			Exhibit 13 10	-	
Flow E	ntering	Merge In	fluence A	rea		Flow Er	nterii	ng Dive	rge Influen	ice Area	
		Actual	Max	Desirable	Violation?			Actual	Max Des	irable	Violation?
V _R	12	4327	Exhibit 13-8	4600:All	No	V ₁₂			Exhibit 13-8		
Level o	of Serv	ice Detern	nination (if not F)		Level of	f Ser	vice De	terminatio	n (if not	F)
D _R	= 5.475 +	0.00734 v _R + (0.0078 V ₁₂ - 0.0	00627 L _A			D _R =	4.252 + 0	.0086 V ₁₂ - 0	.009 L _D	
D _R = 3	36.5 (pc/m	i/ln)				D _R = (pc/mi/	′ln)			
LOS = E	E (Exhibit ⁻	13-2)				LOS = (I	Exhibi	it 13-2)			
Speed Determination						Speed L	Dete	rminatic	on in		
M _S = 0).586 (Exit	oit 13-11)				D _s = (E	Exhibit	13-12)			
S _R = 5	53.6 mph (Exhibit 13-11)				S _R = m	nph (Ex	(hibit 13-12)			
S ₀ = 6	65.5 mph (Exhibit 13-11)				S ₀ = m	nph (Ex	(hibit 13-12)			
S = 5	56.5 mph (Exhibit 13-13)				S= m	nph (Ex	(hibit 13-13)			

BASIC FREEWAY SEGMENTS WORKSHEET									
General Information			Site Information						
Analyst Agency or Company Date Performed	AECOM		Highway/Direction of Travel From/To Jurisdiction	l-95 SB Seg 7-B	et On Ramps				
Analysis Time Period	PM		Analysis Year	2040 Bu	iild 2				
Project Description SW 10t					unning Data				
Flow Inputs)		Des.(IN)		anning Data				
	5640	voh/h	Dook Hour Foster, DHE	0.05					
AADT	5040	veh/day	%Trucks and Buses, P _T	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	ments								
f _p	1.00		E _R	1.2					
Ε _Τ	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	6					
Lane Width		ft							
Rt-Side Lat. Clearance	2	ft	T _{LW}		mph				
Total Ramp Density TRD	5	ramps/mi	^I LC TRD Adjustment		mph				
FFS (measured)	70.0	mph	FFS	70.0	mph				
Base free-flow Speed, BFFS		mph		70.0	mpn				
LOS and Performance	Measures	-	Design (N)						
<u>Operational (LOS)</u> v _p = (V or DDHV) / (PHF x N S D = v _p / S LOS	x f _{HV} x f _p) 2009 62.4 32.2 D	pc/h/ln mph pc/mi/ln	$\frac{\text{Design (N)}}{\text{Design LOS}}$ $v_p = (V \text{ or DDHV}) / (PHF x N x)$ S $D = v_p / S$ Required Number of Lanes, N	f _{HV} x 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 free our volume	speed ee-flow speed	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	13 2, 11-3	f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11				

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Job: SW 10th Street SIMR Analyst: AECOM

Location: Analysis Period:	Seg 8: I- PM Peak	g 8: I-95 Southbound On-Ramp from SW 10th Street EB & W /I Peak Hour									
Analysis Year:	2040 Bui	40 Build 2									
5,640			▶ 7,020			`					
1,380											
	PHF =	0.95									
	v _{fr} =	7,020	vph								
	v _r =	1,380	vph								
	v _f =	5,640									
Upstream Freeway	Tr % =	3%									
Ramp	Tr % =	2%									
Downstream Freeway	Tr % =	3%	·								
Freeway	f _{HV} =	1/(1+P	r(E _⊺ -1)+P _R (E _R -	-1)) =	0.985						
Ramp	f _{HV} =	1/(1+P	r(E _⊤ -1)+P _R (E _R -	-1)) =	0.9901						
flat terrain	Ε _τ =	1.5									
	RV % =	0									
Driver Population adj.	f _P =	1.000									
	V _{fr} =	=v _{fr} /(PF	$(f_{HV})(f_{P}) =$	7,500	pc/h						
	V _r =	=v _r /(PH	$IF)(f_{HV})(f_{P}) =$	1,467	pc/h						
	V _f =	=v _f /(PH	$ F)(f_{HV})(f_{P}) =$	6,026	pc/h						
No. lanes upstream of ramp	N =	3									

<u>No. Ln</u>	Capacity Check (see Exhibits 25-3 and 25-7):	Maximum	Actual	V/c	LOS F?
4	Fwy downstream of ramp (assume 70 mph free-flow speed) =	9,600	7,500	0.78	No
3	Fwy upstream of ramp (assume 70 mph free-flow speed) =	7,200	6,026	0.84	No
1	Capacity on On-Ramp (assume 45 mph free-flow speed) =	2,100	1,467	0.70	No

	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	l-95 SB Seg 9-Be 2040 Bu	et 10th & Exit to Exp ild 2
Project Description SW 10th	h Street SIMR			2010 20	
✓ Oper.(LOS)	1		Des.(N)	Pla	nning Data
Flow Inputs					-
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D	7020	veh/h veh/day veh/h	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade % Length	0.95 3 0 Level mi	
		VCH/H	Up/Down %		
Calculate Flow Adjustr	nents				
f _p	1.00			1.2	
	1.5		$I_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
Speed Inputs			Calc Speed Adj and FFS	5	
Lane Width Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured) Base free-flow Speed, BFFS	4 70.0	ft ft ramps/mi mph mph	f _{∟w} f _{LC} TRD Adjustment FFS	70.0	mph mph mph mph
LOS and Performance	Measures		Design (N)		
<u>Operational (LOS)</u> v _p = (V or DDHV) / (PHF x N) S D = v _p / S LOS	x f _{HV} x f _p) 1875 64.7 29.0 D	pc/h/ln mph pc/mi/ln	<u>Design (N)</u> Design LOS v _p = (V or DDHV) / (PHF x N x S D = v _p / S Required Number of Lanes, N	f _{HV} x 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 free our volume	speed ee-flow speed	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-	-13 2, 11-3	f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

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RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Infor	rmation			Site Infor	mation					
Analyst			Fr	eeway/Dir of Tra	avel	I-95 S	B			
Agency or Company	AEC	MC	Ju	nction		Seg 1	0-Merge fro	m Ex to GP		
Date Performed			Ju	risdiction		Ū	Ū			
Analysis Time Perio	d PM		Ar	alysis Year		2040	Build 2			
Project Description	SW 10th Stree	t SIMR								
Inputs										
LInstream Adi Ramn		Freeway Num	ber of Lanes, N	4					Downstre	am Adi
		Ramp Numbe	r of Lanes, N	1					Ramp	
Yes Or	On Acceleration Lane Length, L. 600									
		Deceloration	and Longth L	000					I Yes	□ On
🗹 No 📃 Of	f								🗌 No	✓ Off
		Freeway Volu	me, V _F	7020						1150 8
$L_{up} = ft$		Ramp Volume	e, V _R	220					└down [—]	1150 11
		Freeway Free	-Flow Speed, S _{FF}	70.0					V_ =	780 veh/h
v _u – ven/r	1	Ramp Free-Fl	ow Speed, S _{FR}	50.0					• D	
Conversion t	o pc/h Und	der Base	Conditions							
(nc/h)	V	PHF	Terrain	%Truck	%Rv		f	f	v = V/PHF	x fx f
(poin)	(Veh/hr)			7011401	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		·HV	.p		ну к тр
Freeway	7020	0.95	Level	3	0).985	1.00	7	500
Ramp	220	0.92	Level	2	0).990	1.00	4	242
UpStream Davum Otras and	700	0.00					000	4.00		50
DownStream	/80	0.92	Level	2	0		J.990		<u> </u>	350
Estimation of	F 1/	werge Areas			Ectimat	ion		Jiverge Areas		
	v 12				LSumau		12			
	V ₁₂ = V _F	(P _{FM})					V ₁₂ =	Vp + (Vr - Vp		
L _{EQ} =	(Equa	ation 13-6 o	r 13-7)		=		12	(Equation 13-	.⁄ ⊦∪ .12 or 13_1	3)
P _{FM} =	0.188	using Equat	ion (Exhibit 13-6)		-EQ P =			using Equation	n /Evhibit 1?	-7)
V ₁₂ =	1407	oc/h			FD					-1)
	3046	oc/h (Equati	on 13-14 or 13-		v ₁₂ –			pc/n		
v ₃ or v _{av34}	17)	、 1			v ₃ or v _{av34}	_		pc/h (Equation 1	13-14 or 13-1	()
Is V_3 or $V_{av34} > 2,70$)0 pc/h? 🗹 Ye	s 🗌 No			Is V ₃ or V _{av}	₃₄ > 2,	700 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 * V ₁₂ /2	Yes No		
If Yes V =	3000	oc/h (Equati	on 13-16, 13-		If Yes,V _{12a} =	=	1	pc/h (Equation	n 13-16, 13	3-18, or
11 103, v _{12a} -	18, or	13-19)			120		1.	3-19)		
Capacity Che	ecks				Capacit	y Ch	necks			
	Actual	C	Capacity	LOS F?			Actual	Cap	pacity	LOS F?
					V _F			Exhibit 13-8	8	
Vro	7742	Exhibit 13-8		No	$V_{FO} = V_{F}$	- V _R		Exhibit 13-8	8	
FO					V			Exhibit 13	-	
					۷R			10		
Flow Entering	g Merge In	fluence A	rea		Flow En	nterii	ng Dive	rge Influen	ice Area	
	Actual	Max	Desirable	Violation?			Actual	Max Desi	irable	Violation?
V _{R12}	3242	Exhibit 13-8	4600:All	No	V ₁₂			Exhibit 13-8		
Level of Serv	rice Detern	nination (if not F)		Level of	f Ser	vice De	terminatio	n (if not	F)
D _R = 5.475 +	0.00734 v _R + 0).0078 V ₁₂ - 0.	00627 L _A			D _R =	4.252 + 0	.0086 V ₁₂ - 0.	.009 L _D	
D _R = 26.9 (pc/m	ni/ln)				$D_{R} = (p)$	oc/mi/	′ln)			
LOS = C (Exhibit	13-2)				I OS = (E	Exhibi	, it 13-2)			
Speed Determination					Speed [Dete	rminatio	<i>n</i>		
w _s = 0.361 (Exi	dit 13-11)				⊂s (⊏ s		10^{-12}			
5 _R 59.9 mph	(Exhibit 13-11)				o _R − m	ihii (⊑x	1011 13-12)			
S ₀ = 63.7 mph	(Exhibit 13-11)				S₀= m	ph (Ex	(hibit 13-12)			
S = 62.1 mph	(Exhibit 13-13)				S = m	ph (Ex	(hibit 13-13)			

		RAMP	S AND RAM	P JUNCTI	ONS WO	RKS	HEET			
General Infor	rmation			Site Infor	mation					
Analyst			Fre	eeway/Dir of Tr	avel I-95 SB					
Agency or Company	AECO	MC	Ju	nction		Seg 11	- Diverge to	o Express		
Date Performed			Ju	risdiction						
Analysis Time Period	d PM		An	alysis Year		2040 B	uild 2			
Project Description	SW 10th Stree	t SIMR								
Inputs		1							1	
Upstream Adj R	Ramp	Freeway Nun	nber of Lanes, N	4					Downstrea	ım Adj
		Ramp Numbe	er of Lanes, N	1					Ramp	
Yes 🗠	⊿ On	Acceleration	Lane Length, L _A						Yes	On
	Deceleration Lane Length L _D 200									
		Freeway Volu	ime. V _r	7240					Mo No	└ Off
L _{up} = 11	150 ft	Ramp Volum	≏ V_	780					L _{down} =	ft
up		Erooway Eroo	Since Second S	700						
V _u = 22	20 veh/h	Down Fron F	lew Speed, S _{FF}	10.0					V _D =	veh/h
	//		low Speed, S _{FR}	45.0						
Conversion t	opc/nUnd	der Base	Conditions		<u> </u>				1	
(pc/h)	V (\/eh/hr)	PHF	Terrain	%Truck	%Rv		f _{HV}	f _p	v = V/PHF	x f _{HV} x f _p
Freeway	7240	0.95	level	3	0	0.	985	1.00	77	35
Ramp	780	0.92	Level	2	0	0	990	1 00	85	i6
UpStream	220	0.92	Level	2	0	0	990	1.00	24	2
DownStream		0.02	20101	-	Ŭ		000	1.00		
	<u>. </u>	Merge Areas		_	Diverge Areas					
Estimation of	f v ₁₂				Estimat	ion o	of v ₁₂			
	V., = V_	(P)					V =	V_ + (V \	/_)P	
. –	·12 ·F	$(\cdot _{\rm FM})$	12 7)		. –		• 12	Fountion 12	'R/'FD 12 or 12 12	\
EQ	(Equa	Equation ($\frac{10-7}{5}$		EQ		()	Lquation 15-		(
FFM -	using	Equation (Exhibit 13-0)		FD -		0.4	430 using ⊨o	luation (Exhi	oil 13-7)
v ₁₂ =	pc/n				v ₁₂ =		38	55 pc/h		
V ₃ or V _{av34}	pc/h (Equation 13	3-14 or 13-17)		V ₃ or V _{av34}		19	940 pc/h (Eq	uation 13-14	or 13-17)
Is V_3 or $V_{av34} > 2,70$)0 pc/h? [] Ye	s 🗌 No			Is V ₃ or V _{av}	₃₄ > 2,7	'00 pc/h?	Yes 🗹 No		
Is V_3 or $V_{av34} > 1.5$	* V ₁₂ /2 Yes	s 🗌 No			Is V ₃ or V _{av}	₃₄ > 1.5	•*V ₁₂ /2 [Yes 🗹 No	1	
lf Yes,V _{12a} =	pc/h (Equation 13	8-16, 13-18, or		If Yes,V _{12a} =	=	p	c/h (Equatio	n 13-16, 13-	18, or 13-
Canacity Che	10-19)				Canacit	v Ch	ocks	9)		
			anacity	LOS F2		<u>y 011</u>	Actual		anacity	LOS E2
	Actual		Japaony	LOOT	V_		7735	Evhibit 13		No.
V		E					070		0 0000	N.
^v FO		EXHIBIL 13-0			$v_{FO} - v_F$	- • _R	6879	Exhibit 13	-0 9600	INO
					V _R		856	Exhibit 13-	10 2100	No
Flow Entering	g Merge In	fluence A	Area		Flow En	nterin	g Dive	rge Influei	nce Area	
	Actual	Max	Desirable	Violation?			Actual	Max Desira	able	Violation?
V _{R12}		Exhibit 13-8			V ₁₂		3855	Exhibit 13-8	4400:All	No
Level of Serv	rice Detern	nination (ïf not F)		Level of	f Ser	vice De	terminatio	on (if not l	F)
$D_{R} = 5.475 + 0.000$.00734 v _R + (0.0078 V ₁₂	- 0.00627 L _A			D _R = 4	1.252 + 0	.0086 V ₁₂ - 0).009 L _D	
D _R = (pc/mi/lr	ı)				D _R = 38	8.9 (pc	/mi/ln)			
LOS = (Exhibit		LOS = E	(Exhil	oit 13-2)						
Speed Deterr	Speed Determination					Deter	minatio	n		
M = (Evibit 1)	2 11)				D = 0	375 (F	xhibit 13-	.12)		
	$\frac{1}{1}$				$S_{p} = 50$	9.5 mnh	(Exhibit	13-12)		
S _R − mpn (Exr	1101t 13-11)				S = 7	2.0 mar		12 12)		
$S_0 = mph (Exh$	1011 13-11)				S_0^- 7.	2.9 mpn		10-12)		
p = mph (Exh	iidit 13-13)				5 = 6	5.2 mph	i (Exhibit	13-13)		
yright © 2016 Universit	ty of Florida, All R	ights Reserved			HCS2010 [™]	^M Versi	on 6.90		Generated: 6	6/15/2020 1:10



	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed	AECOM		Highway/Direction of Travel From/To Jurisdiction	l-95 SB Seg 13-l	Bet Off & On Ramps
Analysis Time Period	PM		Analysis Year	2040 Bu	iild 2
Project Description SW 70					opping Data
)		Jes.(IN)		anning Data
	5180	veh/h	Peak-Hour Factor PHF	0.95	
AADT	5760	veh/day	%Trucks and Buses, P _T	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 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	6	
Lane Width Rt-Side Lat. Clearance	2	ft ft	f _{LW}		mph
Total Ramp Density TRD	3	ramps/mi	^I LC TRD Adjustment		mph
FFS (measured) Base free-flow Speed, BFFS	70.0	mph mph	FFS	70.0	mph
LOS and Performance	Measures		Design (N)		
<u>Operational (LOS)</u> v _p = (V or DDHV) / (PHF x N S D = v _p / S LOS	x f _{HV} x f _p) 1845 65.2 28.3 D	pc/h/ln mph pc/mi/ln	<u>Design (N)</u> Design LOS v _p = (V or DDHV) / (PHF x N x S D = v _p / S Required Number of Lanes, N	f _{HV} x 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 fre our volume	speed ee-flow speed	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-	-13 2, 11-3	f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

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		F	REEWA	(WEAV	ING WOF	RKSHEE	Т					
Genera	Informatio	on			Site Information							
Analyst Agency/Cor Date Perfor Analysis Tin	npany ned ne Period	AECO PM	М		Freeway/Dir of TravelI-95 SBWeaving Segment LocationSeg 14- Bet Sample & CopansAnalysis Year2040 Build 2							
Project Des	cription SW 10th	n Street SIMF	2									
Inputs												
Weaving co Weaving nu Weaving se Freeway fre	nfiguration mber of lanes, N gment length, L _s e-flow speed, FF	S		One-Sided 4 2520ft 70 mph	Segment typ Freeway min Freeway ma: Terrain type	e imum speed ximum capac	, S _{MIN} ity, C _{IFL}		Freeway 15 2400 Leve			
Conver	sions to po	/h Unde	r Base Co	ondition	s	-						
	V (veh/h)	PHF	Truck (%)	RV (%)	Ε _Τ	E _R	f _{HV}	fp	v (pc/h)			
V _{FF}	4415	0.95	3	0	1.5	1.2	0.985	1.00	4717			
V _{RF}	1590	0.92	2	0	1.5	1.2	0.990	1.00	1746			
V _{FR}	765	0.92	2	0	1.5	1.2	0.990	1.00	840			
V _{RR}	0	0.95	0	0	1.5	1.2	1.000	1.00	0			
V _{NW}	4717		-		-		-	V =	7303			
V _W	2586							-				
VR	0.354											
Configu	ration Cha	racteris	tics		1							
Minimum m	aneuver lanes, N	N _{WL}		2 lc	Minimum we	aving lane cl	hanges, LC _{MIN}	I	lc/h			
Interchange	e density, ID			0.7 int/mi	Weaving lan	e changes, L	.C _w		lc/h			
Minimum R	F lane changes,	LC _{RF}		1 lc/pc	Non-weaving	g lane chang	es, LC _{NW}		lc/h			
Minimum F	R lane changes,	LC _{FR}		1 lc/pc	Total lane ch	nanges, LC _{AL}	L		lc/h			
Minimum R	R lane changes,	LC _{RR}		lc/pc	Non-weaving	g vehicle inde	ex, I _{NW}					
Weavin	g Segment	Speed,	Density, I	_evel of	Service,	and Cap	oacity					
Weaving se Weaving se	gment flow rate, gment capacity,	v c _w		7208 veh/h 6678 veh/h	Weaving inte Weaving sec	ensity factor, gment speed	W , S		mph			
Weaving se	gment v/c ratio			1.079	Average wea	aving speed,	S _W		mph			
Weaving se	gment density, [)		pc/mi/ln	Average nor	n-weaving sp	eed, S _{NW}		mph			
Level of Se	rvice, LOS			F	Maximum we	eaving length	n, L _{MAX}		6171 fi			
Notes								·				
a. Weaving s Chapter 13, ' b. For volume	egments longer th Freeway Merge a es that exceed the	an the calcula nd Diverge Se weaving segi	ated maximum le egments". ment capacity, tl	ength should	be treated as is rvice is "F".	solated merge	and diverge ar	eas using the	procedures of			

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	RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Infor	rmation			Site Infor	mation					
Analyst			Fr	eeway/Dir of Tra	avel I	-95 NB	Express Lar	ne		
Agency or Company	AEC	OM	Ju	nction	(Off to S	W 10th Conr	nector		
Date Performed	4 AM		JU Ar	risdiction Voar		2040 Bi	uild 2			
Project Description	SW 10th Stree	t SIMR			2	2040 DI				
Inputs	011 1041 04 00									
Linstroam Adi P	amn	Freeway Nun	nber of Lanes, N	2				ſ	Downetrear	n Adi
	amp	Ramp Numbe	er of Lanes, N	1				F	Ramp	li Auj
Yes	On	Acceleration	Lane Length, L							
	Off	Deceleration	Lane Length L _D	345						
		Freeway Volu	ime, V _F	1370					Mo No	Off
L _{up} = f	t	Ramp Volum	e, V _R	90				L	-down =	ft
		Freeway Free	e-Flow Speed, S _{FF}	70.0					/ -	v ob /b
$V_u = V_v$	eh/h	Ramp Free-F	low Speed, SEP	60.0				ľ	и _р –	ven/n
Conversion t	o pc/h Un	der Base	Conditions							
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	1	f _{HV}	f _p v	v = V/PHF x	c f _{HV} x f _p
Freeway	1370	0.95	Level	3	0	0.9	985	1.00	146	4
Ramp	90	0.95	Level	2	0	0.9	990	1.00	96	
UpStream										
DownStream		Manna Anaaa								
Estimation of	fv	werge Areas			Estimati	on o	Div f v	erge Areas		
Lotination of	<u>12</u>				LStinut		<u>• 12</u>			
	V ₁₂ = V _F	(P _{FM})					V ₁₂ = V	^v _R + (V _F - V _R))P _{FD}	
L _{EQ} =	(Equa	ation 13-6 or $-$	· 13-7)		L _{EQ} =		(Ec		2 or 13-13)	
P _{FM} =	using	Equation (Exhibit 13-6)		P _{FD} =		1.00	0 using Equ	ation (Exhibi	t 13-7)
V ₁₂ =	pc/h				V ₁₂ =		1464	pc/h		
V_3 or V_{av34}	pc/h (Equation 13	3-14 or 13-17)		V_3 or V_{av34}	0.70	0 p	c/h (Equation	13-14 or <i>י</i>	13-17)
IS V_3 or $V_{av34} > 2,70$)U pc/n? ∐Ye	s ∐No			IS V_3 or V_{av3}	4 > 2, /(Yes 🗹 No		
IS V_3 or $V_{av34} > 1.5$	[™] V ₁₂ /2 ∐Ye	s 🛄 No Equation 12	16 12 19 or		Is V_3 or V_{av3}	₄ > 1.5	^ V ₁₂ /2	Yes 🗹 No	12 16 12 1	9 or 12
If Yes,V _{12a} =	13-19)	Equation 13	-10, 13-10, 01		If Yes,V _{12a} =		19)	n (Equation	13-10, 13-1	0, 01 13-
Capacity Che	ecks				Capacity	/ Che	ecks			
	Actual	(Capacity	LOS F?			Actual	Сар	acity	LOS F?
					V _F		1464	Exhibit 13-8	4800	No
V _{FO}		Exhibit 13-8			$V_{FO} = V_{F}$	- V _R	1368	Exhibit 13-8	4800	No
					V _R		96	Exhibit 13-10	2200	No
Flow Entering	a Merae In	Ifluence A	Area		Flow En	terin	a Divera	Ie Influenc	e Area	• • • • •
	Actual	Max	Desirable	Violation?		A	ctual	Max Desirable	e	Violation?
V _{R12}		Exhibit 13-8			V ₁₂	1	464	Exhibit 13-8	4400:All	No
Level of Serv	ice Detern	nination	íf not F)		Level of	Serv	vice Dete	ermination	íf not F)
D _R = 5.475 + 0.	.00734 v _R +	0.0078 V ₁₂	- 0.00627 L _A			D _R = 4	.252 + 0.0	086 V ₁₂ - 0.0	09 L _D	
D _R = (pc/mi/ln)				D _R = 13.	.7 (pc /	mi/ln)			
LOS = (Exhibit	13-2)				LOS = B ((Exhib	it 13-2)			
Speed Determination					Speed D	eteri	nination	1		
M _s = (Exibit 1)	3-11)				D _s = 0.1	12 (E)	hibit 13-1	2)		
$S_{p} = mph (Exh$, nibit 13-11)				S _R = 66.	.9 mph	(Exhibit 13	3-12)		
S_{n} mph (Exhibit 13-11)					S ₀ = N/A	A mph	(Exhibit 13	-12)		
S = mph (Exh	nibit 13-13)				S = 66.	.9 mph	(Exhibit 13	3-13)		

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	RAI	MPS AND	ORKSHE	ET						
General Infe	ormation			Site Infor	mation					
Analyst Agency or Compa Date Performed	ny AEC	ОМ	Fre Jui Jui	eeway/Dir of Tranction Protion Fisdiction	avel	I-95 N On fro	B Express L m SW 10th S	anes St. Connector		
Analysis Time Per	iod AM		An	alysis Year		2040 E	Build 2			
Project Description	n SW 10th Stree	t SIMR								
Inputs		r								
Upstream Adj Ran	np	Freeway Num Ramp Numbe	ber of Lanes, N er of Lanes, N	2 1					Downstrea Ramp	am Adj
Yes 🔲	On	Acceleration I	_ane Length, L _A	1040					Yes	On
🗹 No 🗌 🖸	Off	Deceleration Freeway Volu	Lane Length L _D	1280					🗹 No	Off
L _{up} = ft		Ramp Volume	e, V _R	850					L _{down} =	ft
V _u = veł	ı/h	Freeway Free Domp Free F	e-Flow Speed, S _{FF}	70.0					V _D =	veh/h
Conversion	to no/h Un	dor Paca	Conditions	00.0						
Conversion					r	—				
(pc/h)	(Veh/hr)	PHF	Terrain	%Truck	%Rv		f _{HV}	f _p	v = V/PHF	x f _{HV} x f _p
Freeway	1280	0.95	Level	3	0	0	.985	1.00	1	368
Ramp	850	0.95	Level	2	0	0	.990	1.00	<u> </u>	/04
DownStream	-									
	I	Merge Areas					D	iverge Areas		
Estimation	of v ₁₂				Estimati	ion d	of v ₁₂			
	$V_{12} = V_{E}$	(P _{EM})					V ₁₂ = \	/ _P + (V _E - V _P)P _{ED}	
L _{EO} =	(Equ	ation 13-6 o	r 13-7)		L _{EO} =		(12	Equation 13-	12 or 13-1	3)
P _{EM} =	1.000	using Equa	tion (Exhibit 13-6)		P _{FD} =		ù	sing Equatio	on (Exhibit 13	, -7)
$V_{12} =$	1368	pc/h	, , , , , , , , , , , , , , , , , , ,		V ₁₂ =		p	c/h		,
V_3 or V_{av34}	0 pc/l	h (Equation	13-14 or 13-17)		V_3 or V_{av34}		μ	c/h (Equation 1	13-14 or 13-1	7)
Is V_3 or $V_{av34} > 2$,700 pc/h? 🗌 Ye	s 🗹 No	,		Is V_3 or V_{av3}	, > 2,	700 pc/h? 🗌	Yes No		
Is V_3 or $V_{av34} > 1$.	$.5 * V_{12}/2 \square Ye$	s 🗹 No			Is V_3 or V_{av3}	, 1.5	5 * V ₁₂ /2	Yes No		
If Yes,V _{12a} =	pc/h 13-19)	(Equation 1	3-16, 13-18, or		If Yes,V _{12a} =	-	13	oc/h (Equatio -19)	n 13-16, 13	3-18, or
Capacity Cl	hecks				Capacity	y Ch	ecks			
	Actual	(Capacity	LOS F?	1		Actual	Са	pacity	LOS F?
					V _F			Exhibit 13-	8	
V _{FO}	2272	Exhibit 13-8		No	$V_{FO} = V_{F}$	- V _R		Exhibit 13-	8	
					V _R			Exhibit 13	-	
Flow Enteri	ng Merge In	fluence A	Area		Flow En	<u>terii</u>	ng Diver	ge Influer	ice Area	
	Actual	Max	Desirable	Violation?			Actual	Max Des	irable	Violation?
V _{R12}	2436	Exhibit 13-8	4600:All	No	V ₁₂			Exhibit 13-8		
Level of Se	rvice Detern	nination (if not F)		Level of	Ser	vice Det	terminatio	on (if not	F)
D _R = 5.475	5 + 0.00734 v _R + 0	0.0078 V ₁₂ - 0.	00627 L _A		[[) _R = -	4.252 + 0.	0086 V ₁₂ - 0	.009 L _D	
D _R = 16.3 (pc	:/mi/ln)				D _R = (p	c/mi/	ln)			
LOS = B (Exhil	oit 13-2)				LOS = (E	xhibi	t 13-2)			
Speed Determination					Speed D)eter	rminatio	n		
M _S = 0.241 (E	Exibit 13-11)				D _s = (E:	xhibit	13-12)			
S _R = 63.3 mp	h (Exhibit 13-11)				S _R = mp	oh (Ex	hibit 13-12)			
S ₀ = N/A mph (Exhibit 13-11) S ₀ = mph (Exhibit 13-12)										
$S_0 = 10/A \text{ mph} (Exhibit 13-17)$ S = 63.3 mph (Exhibit 13-13) S = mph (Exhibit 13-13)										

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	RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Info	rmation			Site Infor	mation					
Analyst			Fr	eeway/Dir of Tra	avel	I-95 SE	B Express La	ine		
Agency or Company	AEC	OM	Ju	nction		Off to S	SW 10th Cor	nnector		
Date Performed	d MM		Ju Ar	risdiction		2010 D	uild 2			
Project Description	SW 10th Stree	at SIMR	AI	ialysis i cai		2040 D				
Inputs										
	Jomn	Freeway Nun	nber of Lanes, N	2				ļ	Dournotroor	n A di
Upstream Adj F	kamp	Ramp Numbe	er of Lanes. N	-				l	Jownstrear Ramp	n Adj
Yes	On	Acceleration	Lane Length, L							
No	Off	Deceleration	Lane Length L _D	250						
		Freeway Volu	ume, V _F	1210					INO №	Οff
L _{up} =	ft	Ramp Volum	e, V _R	450				l	-down =	ft
V = v	/oh/h	Freeway Free	e-Flow Speed, S _{FF}	70.0					V. =	veh/h
v _u v		Ramp Free-F	low Speed, S _{FR}	60.0					- D	
Conversion t	to pc/h Un	der Base	Conditions							
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv		f _{HV}	f _p	/ = V/PHF >	c f _{HV} x f _p
Freeway	1210	0.95	Level	3	0	0.	985	1.00	129	3
Ramp	450	0.95	Level	2	0	0.	990	1.00	478	}
UpStream						_				
DownStream		Marga Araas						vorgo Aroas		
Estimation o	f V ₄₀	Nicige Areas			Estimati	ion o	of V ₄₀	Verge Aicus		
	<u> </u>	(D)					<u> </u>			
	$v_{12} = v_F$	(r _{FM}) ation 12 6 or	12 7)				v ₁₂ –	$v_{\rm R} = (v_{\rm F} - v_{\rm R})$	/F _{FD} 2 or 12 12)	
L _{EQ} -	(⊏qua	Equation (13-7		L _{EQ} -		(⊑ 1.0		2 01 13-13) atian (Evhibi	+ 1 2 7)
FFM -	using	Equation (EXHIBIT 13-0)		FD -		1.0	00 using Equ	ation (Exhibi	l 13-7)
$v_{12} - v_{12} - v$	pc/n	Equation 12	(14 or 12 17)		$v_{12} = 12$		125	/3 pc/n	- 40 44	10 47)
$v_3 \cup v_{av34}$	pc/n (00 pc/b2 ⊡v		5-14 01 13-17)		v_3 or v_{av34}	. 27	0 pc/b2	pc/n (Equation	n 13-14 or	13-17)
$15 V_3 01 V_{av34} > 2,70$	* V /2				$15 V_3 O V_{av3}$	34 ~ Z, I 、 1 E	* V /2			
$13 v_3 01 v_{av34} > 1.3$	$v_{12'}^2 \square re$	S III NO Fouation 13	3-16 13-18 or			34 ~ 1.5	v ₁₂ /2 _	res ⊻ No h (Fquation	13-16 13-1	8 or 13-
If Yes,V _{12a} =	13-19)))			If Yes,V _{12a} =	:	19))		0, 01 10
Capacity Che	ecks				Capacit	y Ch	ecks			
	Actual	(Capacity	LOS F?			Actual	Cap	acity	LOS F?
					V _F		1293	Exhibit 13-8	4800	No
V _{FO}		Exhibit 13-8			$V_{FO} = V_{F}$	- V _R	815	Exhibit 13-8	4800	No
					V _R		478	Exhibit 13-10	2200	No
Flow Enterin	g Merge In	nfluence A	Area		Flow En	terin	g Diver	ge Influend	ce Area	
	Actual	Max	Desirable	Violation?		/	Actual	Max Desirabl	е	Violation?
V _{R12}		Exhibit 13-8			V ₁₂	1	1293	Exhibit 13-8	4400:All	No
Level of Serv	vice Deterr	nination ((if not F)		Level of	Ser	vice Det	ermination	n (if not F)
D _R = 5.475 + 0	.00734 v _R +	0.0078 V ₁₂	- 0.00627 L _A		[[D _R = 4	1.252 + 0.0	0086 V ₁₂ - 0.0	09 L _D	
D _R = (pc/mi/Ir	ו)				D _R = 13	8.1 (pc	/mi/ln)			
LOS = (Exhibit	13-2)				LOS = B	(Exhib	oit 13-2)			
Speed Deter	mination				Speed D	Deter	minatio	n		
M _S = (Exibit 1	3-11)				D _s = 0.1	146 (E	xhibit 13-	12)		
S _R = mph (Ext	nibit 13-11)				S _R = 65	5.9 mph	(Exhibit 1	3-12)		
S ₀ = mph (Ext	nibit 13-11)				S ₀ = N/	'A mph	(Exhibit 1	3-12)		
S = mph (Ext	nibit 13-13)				S = 65	5.9 mph	(Exhibit 1	3-13)		

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RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Infor	mation			Site Infor	mation					
Analyst			Fre	eeway/Dir of Tra	avel	I-95 S	B Express L	anes		
Agency or Company	AECO	MC	Ju	nction		On fro	m SW 10th	St. Connector		
Date Performed Analysis Time Period			Ju An	risdiction alvsis Vear		2010 1	Suild 2			
Project Description	SW 10th Street	SIMR	70			20401				
Inputs										
Linstroam Adi Damn		Freeway Num	nber of Lanes, N	2					Downstree	am Adi
		Ramp Numbe	er of Lanes, N	1					Ramp	ani Auj
🗌 Yes 🗌 Or	1	Acceleration I	Lane Length, L	1100						
	c	Deceleration	Lane Length L							
		Freeway Volu	ime, V _r	760					✓ No	Off
L _{up} = ft		Ramp Volume	e, V _D	260					L _{down} =	ft
		, Freeway Free	-Flow Speed, S	70.0						
V _u = veh/h		Ramp Free-F	low Speed, S	60.0					V _D =	veh/h
Conversion to	o nc/h Und	ler Base	Conditions							
(no/h)	V		Torroin	0/ Truck	0/ Du	Т	f	f		vf vf
(pc/n)	(Veh/hr)	РПГ	Terrain	%TTUCK	%RV		'HV	Гр		Λ' _{HV} Λ' _p
Freeway	760	0.95	Level	3	0	0	.985	1.00	3	312
Ramp	260	0.95	Level	2	0	0	.990	1.00	2	276
DownStream						-				
Domotroum	I	Merge Areas				-	I D	iverge Areas		
Estimation of	[•] v ₁₂				Estimati	ion d	of v ₁₂			
	$V_{12} = V_{E}$	(Р _{ЕМ})					$V_{12} = 1$	/ _D + (V _E - V _E)P _{ED}	
L _{EO} =	(Equa	ation 13-6 o	r 13-7)		L _{EO} =		12 (Equation 13-	-12 or 13-1	3)
P _{EM} =	1.000	usina Eaua	tion (Exhibit 13-6)		$P_{eD} =$, U	' sing Equatio	on (Exhibit 13	, -7)
V ₁₂ =	812 p	c/h	,		V ₁₂ =		p	c/h	·	,
V_3 or V_{av34}	0 pc/h	n (Equation	13-14 or 13-17)		V_3 or V_{av34}		p	c/h (Equation 1	13-14 or 13-1	7)
Is V_3 or $V_{av34} > 2,70$	0 pc/h? 🗌 Yes	s 🗹 No	,		Is V_3 or V_{av3}	, × 2,	700 pc/h? 🗌	Yes 🗌 No		
Is V_3 or $V_{av34} > 1.5$	V ₁₂ /2 Yes	s 🗹 No			Is V_3 or V_{av3}	и и > 1.!	5 * V ₁₂ /2	Yes No		
If Yes V =	pc/h (Equation 1	3-16, 13-18, or		If Yes V =	-	12 p	c/h (Equatio	n 13-16, 13	8-18, or
	13-19)						13	-19)		
Capacity Che	CKS		Den e elle :		Capacity		Actual			
	Actual		Japacity	LUS F?	V		Actual	Ca Evhibit 12	o pacity	LUS F?
					V -V	V		EXHIBIT 13-	0	
V _{FO}	1088	Exhibit 13-8		No	V _{FO} - V _F	- v _R		EXIIIDIL 13-	8	
					V _R			10	-	
Flow Entering	, Merge In	fluence A	Area		Flow En	terii	ng Diver	ge Influer	ice Area	
	Actual	Max	Desirable	Violation?			Actual	Max Des	irable	Violation?
V _{R12}	1185	Exhibit 13-8	4600:All	No	V ₁₂			Exhibit 13-8		
Level of Serv	ice Detern	nination (ïf not F)		Level of	Ser	vice De	terminatio	on (if not	F)
D _R = 5.475 +	0.00734 v _R + 0	0.0078 V ₁₂ - 0.	00627 L _A		[[D _R =	4.252 + 0.	0086 V ₁₂ - 0	.009 L _D	
D _R = 6.9 (pc/mi/	'In)				D _R = (p	c/mi/	ln)			
LOS = A (Exhibit	13-2)				LOS = (E	xhibi	t 13-2)			
Speed Detern	nination				Speed D)etei	rminatio	n		
M _S = 0.202 (Exi	bit 13-11)				D _s = (E	xhibit	13-12)			
$S_{p} = 64.4 \text{ mph}$	(Exhibit 13-11)				S _R = mp	oh (Ex	hibit 13-12)			
$S_0 = N/A mph ($	Exhibit 13-11)				S ₀ = mp	oh (Ex	hibit 13-12)			
S = 64.4 mph ((Exhibit 13-13)				S= mp	oh (Ex	hibit 13-13)			
, · · · · · · · · · · · · · · · · · · ·										

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	RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Info	rmation			Site Infor	mation					
Analyst			Fr	eeway/Dir of Tr	avel	I-95 NE	B Express La	ane		
Agency or Company	AEC	OM	Ju	nction		Off to S	SW 10th Cor	nnector		
Date Performed	d DM		Ju Ar	risdiction		2010 D	uild 2			
Project Description	SW 10th Stree	t SIMR		arysis real		2040 D				
Inputs	011 1041 04 00									
Linstroam Adi E	Domp	Freeway Nun	nber of Lanes, N	2				,	Downstroor	n Adi
Upsilealli Auj P	kamp	Ramp Numbe	er of Lanes, N	1				F	Ramp	li Auj
Yes	On	Acceleration	Lane Length, L _A						Nyes	On
✓ No	Off	Deceleration	Lane Length L _D	345					∠ No	
		Freeway Volu	ume, V _F	1230						
$L_{up} = 1$	L _{up} = ft Ramp Volume, V _R 180							l	_down =	ft
V =	/eh/h	Freeway Free	e-Flow Speed, S_{FF}	70.0					V_ =	veh/h
v _u v		Ramp Free-F	low Speed, S _{FR}	60.0					D	
Conversion t	to pc/h Un	der Base	Conditions							
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv		f _{HV}	f _p	/ = V/PHF >	c f _{HV} x f _p
Freeway	1230	0.95	Level	3	0	0.	985	1.00	131	4
Ramp	180	0.95	Level	2	0	0.	990	1.00	191	
UpStream						_				
DownStream		Merge Areas					I Di	verge Areas		
Estimation o	f Via	inorgo rirous			Estimat	ion o	of V ₄₂	Torgo Talous		
	12 V - V	(P)					12	$1/ \pm (1/ - 1/)$	\D	
	V ₁₂ - V _F	$(_{FM})$	13 7)				v ₁₂ −	^V R ['] (^V F ⁻ ^V R	/'FD 2 or 13 13)	
EQ -	(Lqua	Equation (IJ-7		EQ - P -		(∟		2 01 13-13)	+ 1 2 7)
'FM	using nc/b		Exhibit 15-0)		FD -		1.0	00 using ⊑qu M no/h		(13-7)
V_{12}	pc/h	Equation 13	$14 \text{ or } 13_17$		V ₁₂ –		13	na puntion	n 12 14 or	12 17)
$V_3 = V_{av34}$)0 nc/h? □vo		-14 01 10-17)		Is V. or V	> 27	0 00 nc/h? □		11 13-14 01	13-17)
Is V, or V > 15	* V/2				Is V. or V	34 ~ -//	* V/2			
	pc/h (Equation 13	3-16, 13-18, or			34 - 1.5	• 12' ² □	h (Equation	13-16, 13-1	8, or 13-
11 Yes, v _{12a} =	13-19)				II Yes, v _{12a} =		19)		· .
Capacity Che	ecks				Capacit	y Ch	ecks			
	Actual	(Capacity	LOS F?			Actual	Cap	bacity	LOS F?
					V _F		1314	Exhibit 13-8	4800	No
V _{FO}		Exhibit 13-8			$V_{FO} = V_{F}$	- V _R	1123	Exhibit 13-8	4800	No
					V _R		191	Exhibit 13-10	2200	No
Flow Entering	g Merge In	fluence A	Area		Flow En	terin	g Diver	ge Influenc	ce Area	
	Actual	Max	Desirable	Violation?		/	Actual	Max Desirabl	e	Violation?
V _{R12}		Exhibit 13-8			V ₁₂	1	314	Exhibit 13-8	4400:All	No
Level of Serv	vice Deterr	nination	(if not F)		Level of	Ser	vice Det	ermination	n (if not F)
D _R = 5.475 + 0	.00734 v _R +	0.0078 V ₁₂	- 0.00627 L _A			D _R = 4	.252 + 0.0	0086 V ₁₂ - 0.0	009 L _D	
D _R = (pc/mi/Ir	ו)				D _R = 12	2.4 (pc	/mi/ln)			
LOS = (Exhibit	13-2)				LOS = B	(Exhib	oit 13-2)			
Speed Deteri	mination				Speed L	Deter	minatio	n		
M _S = (Exibit 1	3-11)				D _s = 0.	120 (E	xhibit 13-	12)		
S _R = mph (Exh	nibit 13-11)				S _R = 66	5.6 mph	(Exhibit 1	3-12)		
S ₀ = mph (Exh	nibit 13-11)				S ₀ = N/	'A mph	(Exhibit 1	3-12)		
S = mph (Ext		S = 66.6 mph (Exhibit 13-13)								

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RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Infor	mation			Site Infor	mation					
Analyst Agency or Company Date Performed	AECO	MC	Fre Jui Jui	eeway/Dir of Tra nction risdiction	avel	I-95 N On fro	B Express L m SW 10th S	anes St. Connector		
Analysis Time Period	d PM		An	alysis Year		2040 E	Build 2			
Project Description	SW 10th Street	SIMR								
Inputs										
Upstream Adj Ramp		Freeway Nun Ramp Numbe	nber of Lanes, N er of Lanes, N	2 1					Downstrea Ramp	ım Adj
Yes Or	ו	Acceleration	Lane Length, L _A	1040					Yes	On
🗹 No 🛛 🗍 Of	f	Deceleration Freeway Volu	Lane Length L _D	1050					🗹 No	Off
L _{up} = ft		Ramp Volum	e, V _R	440					L _{down} =	ft
V _u = veh/h	1	Freeway Free Domp Free F	e-Flow Speed, S _{FF}	70.0					V _D =	veh/h
Conversion t	o no/h Un/		Conditions	00.0						
Conversion			Conditions		1					
(pc/h)	(Veh/hr)	PHF	Terrain	%Truck	%Rv		f _{HV}	f _p	v = V/PHF	x f _{HV} x f _p
Freeway	1050	0.95	Level	3	0	0	.985	1.00	1	122
Ramp	440	0.95	Level	2	0	0	.990	1.00	4	68
DownStream										
Downouldan	<u>ا</u>	Merge Areas					I D	iverge Areas		
Estimation of	f v ₁₂				Estimati	on d	of v ₁₂			
	$V_{12} = V_{\Gamma}$	(P _{EM})					$V_{40} = $	/_ + (V V_)P _{ED}	
L _{FO} =	(Fauz	tion 13-6 o	r 13-7)		L _{FO} =		12	Fountion 13-	-12 or 13-1:	3)
P _{EM} =	1 000	using Equa	tion (Exhibit 13-6)		Pro =		U U	sing Equatio	on (Exhibit 13	-7)
$V_{10} =$	1122 r	nc/h			V ₁₀ =		n			- /
V_{2} or V_{2}	0 nc/t	(Equation	13-14 or 13-17)		V_{2} or V_{2} or		r	c/h (Equation 1	13-14 or 13-1	7)
$1_{\rm S} V_{\rm a} $ or $V_{\rm av} > 2.70$	0 pc/h? □ ∨o				Is V _a or V	. > 2.	⊾ ⊡ 700 pc/h			
$I_{\rm av34} = 1.5$					Is V _a or V	4 =/	5 * V/2			
If Yes, $V_{12a} =$	pc/h (Equation 1	3-16, 13-18, or		If Yes, V _{12a} =	4	p 13	c/h (Equatio	n 13-16, 13	8-18, or
Capacity Che	ecks				Capacity	/ Ch	ecks	10)		
	Actual	(Capacity	LOS F?			Actual	Са	pacity	LOS F?
					V _F			Exhibit 13-	8	
V _{FO}	1590	Exhibit 13-8		No	V _{FO} = V _F	- V _R		Exhibit 13-	8	
					V _R			Exhibit 13 10	-	
Flow Entering	g Merge In	fluence A	Area		Flow En	teriı	ng Diver	ge Influer	nce Area	
	Actual	Мах	Desirable	Violation?			Actual	Max Des	irable	Violation?
V _{R12}	1724	Exhibit 13-8	4600:All	No	V ₁₂			Exhibit 13-8		
Level of Serv	rice Detern	nination (íif not F)		Level of	Ser	vice De	terminatio	on (if not	F)
D _R = 5.475 +	0.00734 v _R + 0	0.0078 V ₁₂ - 0.	00627 L _A) _R = -	4.252 + 0.	0086 V ₁₂ - 0	.009 L _D	
D _R = 11.1 (pc/m	ni/ln)				D _R = (p	c/mi/	ln)			
LOS = B (Exhibit	13-2)				LOS = (E	xhibi	t 13-2)			
Speed Determination					Speed D	eter	rminatio	n		
M _S = 0.218 (Exi	bit 13-11)				D _s = (E:	xhibit [·]	13-12)			
S _R = 63.9 mph	(Exhibit 13-11)				S _R = mp	oh (Ex	hibit 13-12)			
$S_0 = N/A mph ($	Exhibit 13-11)				S ₀ = mp	oh (Ex	hibit 13-12)			
S = 63.9 mph	(Exhibit 13-13)				S = mp	h (Ex	hibit 13-13)			

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	RAMPS AND RAMP JUNCTIONS WORKSHEET											
General Info	rmation			Site Infor	mation							
Analyst			Fr	eeway/Dir of Tr	avel	I-95 SB	Express L	ane				
Agency or Company	AEC	OM	Ju	nction	(Off to S	SW 10th Co	nnector				
Date Performed	d DM		Ju Ar	risdiction Voar		2010 B	uild 2					
Project Description	SW 10th Stree	et SIMR			· · · · · ·	2040 D						
Inputs												
Linstroam Adi E	Damn	Freeway Nun	nber of Lanes, N	2				ſ	Downstream	n Adi		
Opsiteant Auj I	vanip	Ramp Numbe	er of Lanes, N	1				F	Ramp	пдај		
Yes	On	Acceleration	Lane Length, L _₄							\Box On		
No	Off	Deceleration	Lane Length L _D	250								
		Freeway Volu	ume, V _F	2120					M NO	UΟff		
L _{up} =	ft	Ramp Volum	e, V _R	650				l	-down =	ft		
N/ -		Freeway Free	e-Flow Speed, S _{FF}	70.0					/ =	voh/h		
$v_u = v$	/eh/h	Ramp Free-F	low Speed, S _{FR}	60.0					v _D -	ven/n		
Conversion t	to pc/h Un	der Base	Conditions									
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	Ĩ	f _{HV}	f _p	/ = V/PHF >	k f _{HV} x f _p		
Freeway	2120	0.95	Level	3	0	0.	985	1.00	226	5		
Ramp	650	0.95	Level	2	0	0.	990	1.00	691			
UpStream						<u> </u>						
DownStream		Morgo Aroas						livorgo Aroac				
Estimation o	fv.	werge Areas			Estimati	ion o	fv.	iverge Areas				
	<u> </u>	(D)					<u> </u>	M = M = M				
	v ₁₂ - v _F	(r_{FM})	13 7)				v ₁₂ -	$V_R + (V_F - V_R)$	/ ^F FD 2 or 13 13)			
EQ - P -	(Equa	Equation (13-7		EQ - P -		(L 1 (ation (Evhib	+ 12 7)		
'FM - V =	nc/h		Exhibit 15-0)		'FD		1.0	100 using ∟qu		it 1J-7)		
V_{12}	po/n	Equation 13	$(14 \text{ or } 13_17)$		V ₁₂ –		22	no/h (Equation	n 12 14 or	12 17)		
$V_3 \text{ or } V_{av34}$	00 nc/h? □ Vo		-14 01 10-17)		Is V ₋ or V -		0 00 pc/h? []		11 13-14 01	13-17)		
Is V _a or V $_{av34} > 1.5$	*V/2 □Ve				Is V _a or V av		* V/2					
	pc/h (Equation 13	3-16, 13-18, or			34 - 1.0	•12′ ² ∟	c/h (Equation	13-16, 13-1	8, or 13-		
11 Yes, V _{12a} =	13-19)			II Yes, V _{12a} =		19	ð)	-	-		
Capacity Che	ecks			1	Capacity	y Ch	ecks					
	Actual	(Capacity	LOS F?			Actual	Cap	bacity	LOS F?		
					V _F		2265	Exhibit 13-8	4800	No		
V _{FO}		Exhibit 13-8			$V_{FO} = V_{F}$	- V _R	1574	Exhibit 13-8	4800	No		
					V _R		691	Exhibit 13-10	2200	No		
Flow Enterin	g Merge In	fluence A	Area	î	Flow En	<u>terin</u>	g Diver	rge Influend	ce Area			
	Actual	Max	Desirable	Violation?			Actual	Max Desirabl	e	Violation?		
V _{R12}		Exhibit 13-8			V ₁₂		2265	Exhibit 13-8	4400:All	No		
Level of Serv	/ice Deterr	<u>mination (</u>	(If not F)		Level of	Ser	/ice De	termination	n (If not F)		
$D_{R} = 5.475 \pm 0$.00734 V _R +	0.0078 V ₁₂	- 0.00627 L _A		L	J _R = 4	.252 + 0.	0086 V ₁₂ - 0.0	09 L _D			
D _R = (pc/mi/lr	ר)				D _R = 21	.5 (pc /	/mi/ln)					
LOS = (Exhibit	13-2)				LOS = C	(Exhil	oit 13-2)					
Speed Deter	mination				Speed D	Deter	minatio	n				
M _S = (Exibit 1	3-11)				$D_{s} = 0.1$	165 (E	xhibit 13-	12)				
S _R = mph (Exhibit 13-11)					S _R = 65	.4 mph	(Exhibit	13-12)				
S ₀ = mph (Ext	hibit 13-11)				S ₀ = N/	A mph	(Exhibit 1	13-12)				
S = mph (Ext	5 = mph (Exhibit 13-13)						S = 65.4 mph (Exhibit 13-13)					

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RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Info	rmation			Site Inform	mation					
Analyst			Fre	eeway/Dir of Tra	avel	I-95 S	B Express L	anes		
Agency or Company	y AECO	OM	Ju	nction		On fro	m SW 10th	St. Connector		
Date Performed	nd DM		Ju An	risdiction valueis Voar		2010	Suild 2			
Project Description	SW 10th Stree	t SIMR		arysis rear		2040 [
Inputs										
Linstroam Adi Dami	n	Freeway Num	ber of Lanes, N	2					Downstre	am Adi
	U	Ramp Numbe	r of Lanes, N	1					Ramp	am Auj
Yes O	'n	Acceleration L	ane Length, L	1100						
		Deceleration I	ane Length L							
	11	Freeway Volu	me, V _E	1470					✓ No	Off
L _{up} = ft		Ramp Volume	e, V _D	100					L _{down} =	ft
		Freeway Free	-Flow Speed, S _{EE}	70.0						la /la
V _u = veh/	h	Ramp Free-Fl	ow Speed, S _{FD}	60.0					v _D =	ven/n
Conversion	to pc/h Un	der Base	Conditions							
(nc/b)	V		Torrain	% Truck	9/ Du	Т	f	f		Exf yf
(pc/li)	(Veh/hr)	РПГ	Terrain	70 TTUCK	70RV		'HV	'p	v – v/FTH	^ ' HV ^ ' p
Freeway	1470	0.95	Level	3	0	0	.985	1.00		1571
Ramp	100	0.95	Level	2	0	0	.990	1.00		106
DownStream						+			+	
		Merge Areas					D	iverge Areas		
Estimation o	of v ₁₂				Estimati	ion d	of v ₁₂			
	$V_{12} = V_{F}$	(P _{FM})					V ₁₂ = \	/ _R + (V _F - V _F	_R)P _{FD}	
L _{FO} =	(Equa	ation 13-6 o	13-7)		L _{EO} =		(Equation 13	-12 or 13-1	3)
P _{FM} =	1.000	using Equat	ion (Exhibit 13-6)		P _{FD} =		l	ising Equation	on (Exhibit 1	3-7)
V ₁₂ =	1571	pc/h			V ₁₂ =		p	oc/h		
V_3 or V_{av34}	0 pc/l	h (Equation	13-14 or 13-17)		V_3 or V_{av34}		p	oc/h (Equation	13-14 or 13-1	17)
Is V ₃ or V _{av34} > 2,7	00 pc/h? 🗌 Ye	s 🗹 No			Is V_3 or V_{av3}	₃₄ > 2,7	700 pc/h? [Yes 🗌 No)	
Is V ₃ or V _{av34} > 1.5	* V ₁₂ /2 Ye	s 🗹 No			Is V_3 or V_{av3}	₃₄ > 1.5	5 * V ₁₂ /2	Yes 🗌 No)	
If Yes,V ₁₂₀ =	pc/h	(Equation 13	3-16, 13-18, or		If Yes, V ₁₂₀ =		, p	oc/h (Equatio	on 13-16, 1	3-18, or
Capacity Ch	13-19)				Canacit	v Ch		5-19)		
	Actual		anacity	1.05 F2	Capacity		Actual	Ca	anacity	1 OS F2
	Actual		apacity	LUJT:	V-		Actual	Exhibit 13	-8	LUJT:
N/	4/77	E 1 11 11 40 0			$V_{-2} = V_{-}$	- V_		Exhibit 13	8	
V _{FO}	16/7	Exhibit 13-8		No	^v FO ^v F	۲R		Exhibit 13	3-	
					V _R			10		
Flow Enterin	ng Merge In	fluence A	rea		Flow En	terii	ng Diver	ge Influer	nce Area	
	Actual	Max	Desirable	Violation?		_	Actual	Max Des	sirable	Violation?
V _{R12}	1865	Exhibit 13-8	4600:All	No	V ₁₂			Exhibit 13-8		
Level of Ser	vice Detern	nination (if not F)		Level of	Ser	vice De	terminatio	on (if not	: F)
D _R = 5.475	+ 0.00734 v _R + (0.0078 V ₁₂ - 0.	00627 L _A		[D _R = .	4.252 + 0.	0086 V ₁₂ - 0	0.009 L _D	
D _R = 11.6 (pc/r	mi/ln)				D _R = (p	c/mi/	ln)			
LOS = B (Exhibi	t 13-2)				LOS = (E	xhibi	t 13-2)			
Speed Deter	mination				Speed D)etei	rminatio	n		
M _S = 0.214 (Ex	(ibit 13-11)				D _s = (E	xhibit [·]	13-12)			
S _R = 64.0 mph	ı (Exhibit 13-11)				S _R = m	oh (Ex	hibit 13-12)			
$S_0 = N/A mph (Exhibit 13-11)$ $S_0 = mph (Exhibit 13-12)$										
S ₀ = N/A mph (Exhibit 13-11) S = 64.0 mph (Exhibit 13-13) S						ph (Ex	hibit 13-13)			

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RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Inf	ormation			Site Infor	mation					
Analyst Agency or Compa Date Performed	any AEC	MC	Fre Jui Jui	eeway/Dir of Tra nction risdiction	avel	I-95 N N. of H	B CD Hillsboro Blvd	l.		
Analysis Time Pe	riod AM		An	alysis Year		2040 E	Build 2			
Project Descriptio	on SW 10th Stree	t SIMR								
Inputs		r								
Upstream Adj Rai	mp	Freeway Num Ramp Numbe	ber of Lanes, N r of Lanes, N	2 1					Downstrea Ramp	am Adj
Yes 🗌	On	Acceleration L	ane Length, L _A	890					Yes	On
✓ No	Off	Deceleration I	ane Length L _D	1200					🗹 No	Off
L _{up} = ft		Ramp Volume	e, V _R	810					L _{down} =	ft
V = vel	h/h	Freeway Free	Flow Speed, S _{FF}	55.0					V _D =	veh/h
		Ramp Free-Fl	ow Speed, S _{FR}	40.0						
Conversior	n to pc/h Un	der Base	Conditions		r					
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv		f _{HV}	f _p	v = V/PHF	x f _{HV} x f _p
Freeway	1300	0.95	Level	3	0	0	.985	1.00	1	389
Ramp	810	0.95	Level	2	0	0	.990	1.00	8	361
UpStream DownStream						_				
DownStream		Merge Areas					I Di	verge Areas		
Estimation	of V ₁₂	Joine			Estimati	ion d	of v_{12}	iongo i nouo		
	V = V	(P)					$V_{in} = V$	′_ + (V V_)P	
L = 0 =	•12 •F	tion 13-6 o	13-7)				• 12 •	R (VF VR	12 or 13-1	3)
- <u>ео</u> Р =	1 000	using Fauat	ion (Exhibit 13-6)		EQ Pro =		(-	sing Equation	n (Exhibit 1	() (-7)
. FM V.o =	1389	nc/h			· FD V =		n	c/h		, , ,
V _a or V _a	0 pc/	h (Fauation	13-14 or 13-17)		V _a or V _a		P n	c/h (Equation 1	3-14 or 13-1	7)
I_{av34}	2.700 pc/h?		10-14-01-10-17)		Is V _a or V	. > 2	۳ 700 pc/h?			,,
Is V _a or V $_{av34} > 1$.5 * V. /2				Is V _a or V	4 · _/	5 * V/2			
If Yes,V _{12a} =	pc/h	(Equation 13	8-16, 13-18, or		If Yes, V _{12a} =	4	p	c/h (Equatio	n 13-16, 1	3-18, or
Capacity C	hecks				Capacity	v Ch	ecks	10)		
	Actual	C	apacity	LOS F?			Actual	Ca	pacity	LOS F?
					V _F			Exhibit 13-	8	
V _{FO}	2250	Exhibit 13-8		No	$V_{FO} = V_{F}$	- V _R		Exhibit 13-	8	
					V _R			Exhibit 13 10	-	
Flow Enter	ing Merge In	fluence A	rea	-	Flow En	terii	ng Diver	ge Influer	ice Area	
	Actual	Max	Desirable	Violation?			Actual	Max Des	irable	Violation?
V _{R12}	2250	Exhibit 13-8	4600:All	No	V ₁₂			Exhibit 13-8		
Level of Se		Level of	Ser	vice Det	erminatio	n (if not	F)			
D _R = 5.47	5 + 0.00734 v _R + 0	0.0078 V ₁₂ - 0.0	00627 L _A		[[) _R = 4	4.252 + 0.0	0086 V ₁₂ - 0	.009 L _D	
D _R = 17.0 (p	c/mi/ln)				D _R = (p	c/mi/	ln)			
LOS = B (Exhi	ibit 13-2)				LOS = (E	xhibi	t 13-2)			
Speed Determination Speed Determination					Speed D)eter	rminatio	n		
M _S = 0.287 (Exibit 13-11)				D _s = (E:	xhibit	13-12)			
S _R = 51.3 m	ph (Exhibit 13-11)				S _R = mp	oh (Ex	hibit 13-12)			
S ₀ = N/A mp	$S_0^{-} = N/A mph (Exhibit 13-11)$ $S_0^{-} = mph (Exhibit 13-12)$									
S = 51.3 mph (Exhibit 13-11) S = mph (Exhibit 13-13) S = mph (Exhibit 13-13)										

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RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Infor	rmation			Site Infor	mation					
Analyst Agency or Company Date Performed	AECO	DM	Fre Ju	eeway/Dir of Tra nction risdiction	avel	I-95 N N. of I	B CD Hillsboro Blvo	1.		
Analysis Time Perior	d PM		An	alysis Year		2040 I	Build 2			
Project Description	SW 10th Street	t SIMR								
Inputs									h	
Upstream Adj Ramp		Freeway Num Ramp Numbe	nber of Lanes, N er of Lanes, N	2 1					Downstrea Ramp	am Adj
Yes Or	ו	Acceleration I	Lane Length, L _A	890					Yes	On
🗹 No 🗌 Of	f	Deceleration	Lane Length L _D	1770					✓ No	Off
L _{up} = ft		Ramp Volume	ime, v _F e, V _D	740					L _{down} =	ft
V = vch/b		Freeway Free	e-Flow Speed, S _{FF}	55.0					V., =	veh/h
v _u – ven/i	1	Ramp Free-F	low Speed, S _{FR}	40.0					U	
Conversion t	o pc/h Und	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	1770	0.95	Level	3	0	0	.985	1.00	1	891
Ramp	740	0.95	Level	2	0	0	.990	1.00	7	'87
UpStream										
DownStream	L									
Estimation of	fv	vierge Areas			Fstimati	ion	D Df V	iverge Areas		
	12	(5.)			Lounau		<u>12</u>		<u>, </u>	
	$V_{12} = V_{F}$	(P _{FM})					V ₁₂ = \	/ _R + (V _F - V _R)P _{FD}	
L _{EQ} =	(Equa	ation 13-6 o	r 13-7)		L _{EQ} =		(Equation 13-	12 or 13-1	3)
P _{FM} =	1.000	using Equa	tion (Exhibit 13-6)		P _{FD} =		U	sing Equatio	on (Exhibit 13	-7)
V ₁₂ =	1891	oc/h			V ₁₂ =		p	c/h		
V ₃ or V _{av34}	0 pc/ł	n (Equation	13-14 or 13-17)		V_3 or V_{av34}		þ	c/h (Equation 1	3-14 or 13-1	7)
Is V_3 or $V_{av34} > 2,70$	00 pc/h? 🗌 Yes	s 🗹 No			Is V_3 or V_{av3}	₃₄ > 2,	700 pc/h? 🗌	Yes 🗌 No		
Is V_3 or $V_{av34} > 1.5$	*V ₁₂ /2 Ye s	s 🗹 No			Is V_3 or V_{av3}	₈₄ > 1.!	5 * V ₁₂ /2	Yes 🗌 No		
If Yes,V _{12a} =	pc/h (13_19)	Equation 1	3-16, 13-18, or		If Yes,V _{12a} =		p 13	c/h (Equatio	n 13-16, 13	3-18, or
Capacity Che	ecks				Capacity	v Ch	ecks	-10)		
	Actual	(Capacity	LOS F?			Actual	Са	pacity	LOS F?
					V _E			Exhibit 13-	8	
V _{FO}	2678	Exhibit 13-8		No	V _{FO} = V _F	- V _R		Exhibit 13-	8	
					V _R			Exhibit 13 10	-	
Flow Enterin	a Merae In	fluence A	lrea	8	Flow En	terii	na Diver	ae Influer	ice Area	
,	Actual	Max	Desirable	Violation?			Actual	Max Des	irable	Violation?
V _{R12}	2678	Exhibit 13-8	4600:All	No	V ₁₂			Exhibit 13-8		
Level of Serv	vice Detern	nination (if not F)		Level of	Ser	vice De	terminatio	n (if not	F)
D _p = 5.475 +	0.00734 v _p + 0).0078 V ₁₂ - 0.	00627 L		[) _p = 1	4.252 + 0.	0086 V ₁₂ - 0	.009 L _D	
$D_{\rm p} = 20.4 (\rm pc/m$	ni/ln)	12	7		D _D = (p	c/mi/	ln)	12	D	
LOS = C (Exhibit	, 13-2)				LOS = (E	xhibi	, t 13-2)			
Speed Deter	nination				Speed D)etel	rminatio	n		
	bit 12 11)				$D_{a} = (F)$	xhihit	13-12)			
U.3U/ (EX	UIL I J-11)				S _n = mr	nh (Fv	hihit 13-12			
$P_R = 51.0 \text{ mph}$	(⊏XIIIDIL 13-11)				$S_{-} = mr$	(⊏∧ h (⊑v	hihit $12_{-}12$			
$S_0 = N/A mph (Exhibit 13-11)$ $S_0 = mph (Exhibit 13-12)$										
S = 51.0 mph (Exhibit 13-13) S = mph (Exhibit 13-13)										

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