

APPENDIX G

2020 & 2040 No-Build Freeway HCS Analysis

Analyst Agency/Co Date Perfo Analysis Ti	rmed	AECO AM	М		Site InformationFreeway/Dir of TravelI-95 NBWeaving Segment LocationSeg 1-Bet Copans & SampleAnalysis YearNo-Build 2020					
Project De: Inputs	scription SW 10th	h Street SIM	R							
Weaving c Weaving n Weaving s	onfiguration umber of lanes, N egment length, L _s ee-flow speed, Ff	3		One-Sided 4 1820ft 70 mph		nimum speed ximum capac			Freewa 1: 240 Leve	
Convei	rsions to po	1			1	1	1	1	1	
	V (veh/h)	PHF	Truck (%)	RV (%)	Ε _Τ	E _R	f _{HV}	fp	v (pc/h)	
V _{FF}	4435	0.95	3	0	1.5	1.2	0.985	1.00	4738	
V _{RF}	345	0.92	2	0	1.5	1.2	0.990	1.00	379	
V _{FR}	810	0.92	2	0	1.5	1.2	0.990	1.00	889	
V _{RR}	0	0.92	0	0	1.5	1.2	1.000	1.00	0	
V _{NW}	4738							V =	6006	
V _w	1268									
VR	0.211									
Config	uration Cha	aracteris	tics		1					
Minimum r	maneuver lanes, l	N _{WL}		2 lc	Minimum w	eaving lane c	hanges, LC_{MIN}		1268 lc/ł	
Interchang	je density, ID			0.7 int/mi	Weaving lar	ne changes, L	.C _w		1640 lc/ł	
	RF lane changes,	Tu I		1 lc/pc	Non-weavin	ig lane chang	es, LC _{NW}		1192 lc/ł	
Minimum F	R lane changes,	$\rm LC_{FR}$		1 lc/pc	Total lane c	hanges, LC _{AL}	L		2832 lc/ł	
Minimum F	RR lane changes,	, LC _{RR}		lc/pc	Non-weavin	g vehicle inde	ex, I _{NW}		604	
Weavir	ng Segment	t Speed,	Density,	Level of	Service,	and Cap	pacity			
Weaving s	egment flow rate,	, V		5924 veh/h	Ŭ	ensity factor,			0.320	
Weaving s	egment capacity,	C _w		8603 veh/h		gment speed			54.3 mpł	
•	egment v/c ratio			0.689	-	aving speed,			56.7 mpł	
-	egment density, I	D	2	7.7 pc/mi/ln	-	n-weaving sp			53.7 mpł	
Level of Se	ervice, LOS			С	Maximum w	eaving lengtl	n, L _{MAX}		4650 f	
	segments longer th	han the calcul and Diverge S		ength should b	be treated as i	solated merge	and diverge are	eas using the	procedures of	

General Information			Site Information		
Analyst	450014		Highway/Direction of Travel	I-95 NB Seg 2-Bet	Off & On from
Agency or Company	AECOM		From/To	Sample	
Date Performed Analysis Time Period	AM		Jurisdiction Analysis Year	No-Build 20	020
Project Description SW 10th	n Street SIMR				
Oper.(LOS)			Des.(N)	🗌 Plann	ing Data
Flow Inputs					
Volume, V	4780	veh/h	Peak-Hour Factor, PHF	0.95	
AADT		veh/day	%Trucks and Buses, P _T	3	
Peak-Hr Prop. of AADT, K			%RVs, P _R	0	
Peak-Hr Direction Prop, D			General Terrain:	Level	
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	mi	
Coloulata Flour Adiusta			Op/Down //		
Calculate Flow Adjustn			_		
f _p	1.00		E _R	1.2	
E _T	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
Speed Inputs			Calc Speed Adj and FFS	5	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f _{LW}		mph
Number of Lanes, N	3		f _{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			
LOS and Performance	Measures		Design (N)		
			Design (N)		
Operational (LOS)			Design LOS		
v _p = (V or DDHV) / (PHF x N x	I.	pc/h/ln	$v_p = (V \text{ or DDHV}) / (PHF x N x)$	f _{HV} x f _n)	pc/h/ln
S	67.1	mph	S	nv p	mph
$D = v_p / S$	25.4	pc/mi/ln	D = v _p / S		pc/mi/ln
LOS	С		Required Number of Lanes, N		·
Glossary			Factor Location		
N - Number of lanes	S - Speed				
V - Hourly volume	D - Density		E _R - Exhibits 11-10, 11-12		LW - Exhibit 11-8
v _p - Flow rate	FFS - Free-flow	speed	E _T - Exhibits 11-10, 11-11, 11-		_{LC} - Exhibit 11-9
LOS - Level of service	BFFS - Base fre	-	f _p - Page 11-18		FRD - Page 11-1
DDHV - Directional design ho			LOS, S, FFS, v _p - Exhibits 11-2	2, 11-3	
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		RAI	MPS AND	RAMP JUN	CTIONS W	ORKSHE	ET			
Genera	l Inforr	nation			Site Infor	mation				
Analyst				Fr	eeway/Dir of Tr	avel I-9	95 NB			
gency or (AECO	MC	Ju	nction	Se	eg 3-On Ramp	from Sample		
ate Perfor					risdiction					
	me Period	AM		Ar	nalysis Year	No	o-Build 2020			
	scription	SW 10th Stree	t SIMR							
nputs				ber of Lanes, N	2					
Jpstream A	Adj Ramp				3				Downstre	eam Adj
Yes	On		Ramp Numbe		1				Ramp	
				ane Length, L _A	500				🗹 Yes	🗹 On
✓ No	🗌 Off		Deceleration I	ane Length L _D					🗌 No	Off
			Freeway Volu	me, V _F	4780					
up =	ft		Ramp Volume	e, V _R	1250				L _{down} =	1950 ft
	- I- <i>(</i>)-		Freeway Free	-Flow Speed, S _{FF}	70.0				V _D =	890 veh/h
/ _u =	veh/h		Ramp Free-Fl	ow Speed, S _{FR}	50.0				vD -	090 VEII/II
Conver	rsion to	pc/h Und		Conditions						
		V	PHF		0/ Truck	%Rv	f	f	у – У/РН	F x f _{HV} x f _p
(pc/	/11)	(Veh/hr)		Terrain	%Truck		f _{HV}	f _p		Г
Freeway		4780	0.95	Level	3	0	0.985	1.00		5107
Ramp		1250	0.92	Level	2	0	0.990	1.00		1372
UpStream										
DownStrea	am	890	0.92	Level	2	0	0.990	1.00		977
Totima	tion of		Merge Areas			Estimatio	nofy	Diverge Areas		
.50111a						LSumatio	12			
		V ₁₂ = V _F	(P _{FM})				V ₁₂ =	V _R + (V _F - V _R)P _{ED}	
EQ =		(Equa	ation 13-6 o	⁻ 13-7)		L _{EQ} =		(Equation 13-		13)
Р _{FM} =		0.591	using Equat	ion (Exhibit 13-6)		$P_{FD} =$		using Equation		-
/ ₁₂ =		3021	pc/h			V ₁₂ =		pc/h		,
V_3 or V_{av34}			pc/h (Equati	on 13-14 or 13-		V_3 or V_{av34}		pc/h (Equation 1	3-14 or 13-	17)
		17)					> 2.700 nc/h2	Yes No		,
) pc/h? 🗌 Ye								
ls V ₃ or V _a	_{iv34} > 1.5 *	V ₁₂ /2 Ve					~1.5 V ₁₂ /2	Yes No pc/h (Equatio	n 13-16	13-18 or
f Yes,V _{12a}	=		pc/h (Equati 13-19)	on 13-16, 13-		lf Yes,V _{12a} =	1	3-19)	II 10-10,	10-10, 01
anaci	ty Che		13-19)			Capacity	Chocks	-		
Japach	ty oned	Actual		apacity	LOS F?		Actual	Ca	pacity	LOS F?
		Actual		apacity		V _F	Actual	Exhibit 13-	1	LOOT:
						· · · ·	V		_	
V _F	•O	6479	Exhibit 13-8		No	V _{FO} = V _F - '	v _R	Exhibit 13-		
						V _R		Exhibit 13 10	-	
-low F	nterina	Merge In	fluence A	rea		Flow Ente	erina Dive	erge Influen		
		Actual	1	Desirable	Violation?		Actual	Max Des		Violation?
V _R	12	4393	Exhibit 13-8	4600:All	No	V ₁₂		Exhibit 13-8		
		ce Detern					Service De	eterminatio	n (if no	t F)
).00734 v _R + (,				0.0086 V ₁₂ - 0		/
	36.0 (pc/mi		12 0.	- A			/mi/ln)	12 0	<u> </u>	
							-			
	E (Exhibit 1	-					hibit 13-2)			
speed	Determ	ination				1 '	eterminati	on		
1 _s = 0	0.586 (Exib	it 13-11)					nibit 13-12)			
5 _R = 5	53.6 mph (I	Exhibit 13-11)				S _R = mph	ı (Exhibit 13-12)		
	64.3 mph (E	Exhibit 13-11)				S ₀ = mph	ı (Exhibit 13-12)		
	• •	Exhibit 13-13)				S = mph	ı (Exhibit 13-13)		
at @ 2016 I	Iniversity of	Florida, All Rigi	hts Posonvod			HCS2010 TM	N/		Conorat	ed: 5/20/2019

General Information			Site Information		
Analyst			Highway/Direction of Travel	1-95 NB	t On from Sample &
Agency or Company	AECOM		From/To	Зеу 4-ве Ехр	
Date Performed Analysis Time Period	AM		Jurisdiction Analysis Year	No-Build	2020
Project Description SW 10th			Analysis Teal	NO-Bulla	2020
Oper.(LOS)			Des.(N)	Dlar	nning Data
Flow Inputs			Des.(IN)		ining Data
Volume, V	6030	veh/h	Peak-Hour Factor, PHF	0.95	
AADT	0030	veh/day	%Trucks and Buses, P_T	0.95 3	
Peak-Hr Prop. of AADT, K		veniady	%RVs, P _R	0	
Peak-Hr Direction Prop, D			General Terrain:	Level	
$DDHV = AADT \times K \times D$		veh/h	Grade % Length	mi	
			Up/Down %		
Calculate Flow Adjustn	nents				
f _p	1.00		E _R	1.2	
Ē _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	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		mph		10.0	mpir
LOS and Performance	Moasuros		Design (N)		
	ineasures				
Operational (LOS)			<u>Design (N)</u>		
v _p = (V or DDHV) / (PHF x N x	к f _{нv} x f _n) 2148	pc/h/ln	Design LOS	.	
S	59.6	mph	v _p = (V or DDHV) / (PHF x N x	t _{HV} x t _p)	pc/h/ln
$D = v_p / S$	36.1	pc/mi/ln	S		mph
LOS	E	p0/111/11	$D = v_p / S$		pc/mi/ln
	L		Required Number of Lanes, N		
Glossary			Factor Location		
N - Number of lanes	S - Speed				
V - Hourly volume	D - Density		E _R - Exhibits 11-10, 11-12	40	f _{LW} - Exhibit 11-8
v _p - Flow rate	FFS - Free-flow	speed	E _T - Exhibits 11-10, 11-11, 11-	-13	f _{LC} - Exhibit 11-9
LOS - Level of service	BFFS - Base fre	-	f _p - Page 11-18		TRD - Page 11-11
DDHV - Directional design ho			LOS, S, FFS, v _p - Exhibits 11-	2, 11-3	
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		RAI	MPS AND	RAMP JUN		/ORKSHE	ET				
Genera	l Inforr	nation			Site Infor	mation					
Analyst				Fre	eeway/Dir of Tr	avel I-	-95 NB				
gency or (AECO	MC	Ju	nction	S	Seg 5-O	n from Exp			
ate Perfor					risdiction						
nalysis Tir		AM		An	alysis Year	N	lo-Builo	1 2020			
	cription	SW 10th Stree	t SIMR								
nputs			Fragway Num	ber of Lanes, N	3						
Jpstream A	Adj Ramp									Downstre	eam Adj
Yes	🗌 On		Ramp Numbe		1					Ramp	
				ane Length, L _A	600					🗹 Yes	🗌 On
✓ No	Off		Deceleration I	_ane Length L _D						🗌 No	✓ Off
			Freeway Volu	me, V _F	6030						
up =	ft		Ramp Volume	e, V _R	890					L _{down} =	5545 ft
	- I- <i>(</i> I-		Freeway Free	-Flow Speed, S _{FF}	70.0					V _D =	1070 veh/h
′ _u =	veh/h		Ramp Free-Fl	ow Speed, S _{FR}	50.0					• D	
Conver	sion to	pc/h Und	der Base	Conditions							
(pc/		V	PHF	Terrain	%Truck	%Rv	f		f _p	v = V/PH	F x f _{HV} x f _p
	"')	(Veh/hr)		Terrain				HV	r		L.
reeway		6030	0.95	Level	3	0	0.9	85	1.00		6443
Ramp		890	0.92	Level	2	0	0.9	90	1.00		977
UpStream		4070	0.00						4.00		4475
DownStrea	im	1070	0.92	Level	2	0	0.9	<u>I</u>	1.00		1175
etimat	tion of		Merge Areas			Estimatio	on of	EV.	verge Areas		
.50111a						LSuman		v 12			
		$V_{12} = V_{F}$	(P _{FM})					$V_{12} = V$	_R + (V _F - V _R))P _{FD}	
EQ =		6760.64	(Equation	13-6 or 13-7)		L _{EQ} =			quation 13-		13)
Р _{FM} =		0.604	using Equat	tion (Exhibit 13-6)		P _{FD} =			ing Equation		-
′ ₁₂ =		3894 p	oc/h			V ₁₂ =			:/h	(- /
V_3 or V_{av34}			oc/h (Equati	on 13-14 or 13-		V_3 or V_{av34}			/h (Equation 1	3-14 or 13-	.17)
	0 700	17)	_			Is V ₃ or V _{av34}	> 2 70			0 14 01 10	,
) pc/h? 🗌 Yes									
Is V ₃ or V _{av}	_{v34} > 1.5 *	V ₁₂ /2 √ Yes				Is V_3 or V_{av34}	- 1.0		res ∟no :/h (Equatior	13_16 ·	13-18 or
Yes,V _{12a}	=	3894 µ 18, or		on 13-16, 13-		If Yes,V _{12a} =			/// (Equation 19)	110-10,	10-10, 01
Capacit	ty Che		13-19)			Capacity	Che	rks			
Jupuen	ly one	Actual		apacity	LOS F?			Actual	Can	acity	LOS F?
		71010101	Ĩ	apaony	20011	V _F		rotaar	Exhibit 13-8		
		- / • •				· · · · ·	V		Exhibit 13-8	_	
V _F	0	7420	Exhibit 13-8		Yes	V _{FO} = V _F -	[™] R		Exhibit 13-		_
						V _R			10		
low Er	nterina	Merge In	fluence A	rea	•	Flow Ent	erind	a Diver	e Influen	ce Area	 a
		Actual	1	Desirable	Violation?		-	ctual	Max Desi		Violation?
V _{R1}	12	5338	Exhibit 13-8	4600:All	Yes	V ₁₂			Exhibit 13-8		
		ce Detern	nination (if not F)			Serv	ice Det	erminatio	n (if no	t F)
		0.00734 v _R + 0		,					086 V ₁₂ - 0.		/
	2.9 (pc/mi		12	~			c/mi/ln		12	U	
							xhibit	-			
	Exhibit 1							-			
-	Jeterm	nination				Speed De			1		
/I _S = 1	.073 (Exib	it 13-11)				D _s = (Exhibit 13-12)					
6 _R = 4	0.0 mph (I	Exhibit 13-11)				S _R = mph (Exhibit 13-12)					
6 ₀ = 6	4.3 mph (E	Exhibit 13-11)				S ₀ = mph (Exhibit 13-12)					
	4.7 mph (I	Exhibit 13-13)				S = mpł	h (Exhi	bit 13-13)			
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General Information			Site Information		
Analyst Agency or Company Date Performed	AECOM		Highway/Direction of Travel From/To Jurisdiction	I-95 NB	
Analysis Time Period	AM		Analysis Year	No-Build	2020
Project Description SW 10th	h Street SIMR				
✓ Oper.(LOS)			Des.(N)	Pla	nning Data
Flow Inputs					
Volume, V AADT	6920	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T	0.95 3	
Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	%RVs, P _R General Terrain: Grade % Length Up/Down %	0 Level mi	
Calculate Flow Adjustr	nents				
f _p	1.00		E _R	1.2	
É _T	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
Speed Inputs			Calc Speed Adj and FFS	6	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f _{LW}		mph
Number of Lanes, N	3		f _{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			
LOS and Performance	Measures		Design (N)		
Operational (LOS)			<u>Design (N)</u> Design LOS		
v _p = (V or DDHV) / (PHF x N : S D = v _p / S LOS	x f _{HV} x f _p)2464 51.5 47.9 F	pc/h/ln mph pc/mi/ln	$v_p = (V \text{ or DDHV}) / (PHF x N x)$ 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	S - Speed D - Density FFS - Free-flow BFFS - Base free	-	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-1 ⁻

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		RAMP	S AND RAM	P JUNCTI	ONS WO	RKS	HEET			
General Inf	formation			Site Infor	mation					
Analyst				eeway/Dir of Tr		I-95 NE				
Agency or Compa	any AEC	OM		Inction		Seg 7-0	Off Ramp f	o 10th St		
Date Performed	ariad ANA			Irisdiction			4 0000			
Analysis Time Pe Project Descriptic	eriod AM on SW 10th Stree		Ar	nalysis Year		No-Bui	d 2020			
Inputs										
		Eroowov Num	ber of Lanes, N	3					-	
Upstream Ac	dj Ramp	-							Downstrea	ım Adj
Yes	On	Ramp Numbe		1					Ramp	
			ane Length, L _A						🗹 Yes	🗹 On
🗹 No	Off	Deceleration L	ane Length L _D	250					🗌 No	Off
		Freeway Volu	me, V _F	6920						
L _{up} =	ft	Ramp Volume	, V _R	1070					L _{down} =	1370 ft
		Freeway Free	-Flow Speed, S _{FF}	70.0					V -	4400
V _u =	veh/h		ow Speed, S _{ER}	45.0					V _D =	1460 veh
Convorsion	n to pc/h Un		- 11	10.0						
								_		
(pc/h)	(Veh/hr)	PHF	Terrain	%Truck	%Rv		f _{HV}	f _p	v = V/PHF	x f _{HV} x f _p
Freeway	6920	0.95	Level	3	0	0.	985	1.00	73	93
Ramp	1070	0.92	Level	2	0	0.	990	1.00	11	75
UpStream										
DownStream	1460	0.92	Level	2	0	0.	990	1.00	16	03
		Merge Areas		-				Diverge Areas		
Estimation	of v ₁₂				Estimat	ion o	f v ₁₂			
	V ₁₂ = V _F	(P)					V40 =	= V _R + (V _F - V _F)P _{ED}	
_	12 1	ation 13-6 or	12 7)		. =			Equation 13-1	5	\
EQ =					L _{EQ} = D -			-		
P _{FM} =	Ū.	Equation (E	-XNIDIT 13-6)		P _{FD} =			521 using Equ	Jation (Exhi	01(13-7)
/ ₁₂ =	pc/h				V ₁₂ =			115 pc/h		
V_3 or V_{av34}			-14 or 13-17)		$V_3^{}$ or $V_{av34}^{}$			978 pc/h (Equ	ation 13-14	or 13-17
Is V_3 or V_{av34} > 2	2,700 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	1.5 * V ₁₂ /2 🗌 Ye	s 🗌 No			Is V_3 or V_{av}	₃₄ > 1.5	* V ₁₂ /2 [🗌 Yes 🗹 No		
f Yes,V _{12a} =			-16, 13-18, or		If Yes,V _{12a} =	=		693 pc/h (Equ	ation 13-16	8, 13-18,
120	13-19)			-24			r 13-19)		
Capacity C				1	Capacit	y Ch		-		
	Actual	C	apacity	LOS F?			Actual	_	pacity	LOS F
					V _F		7393	Exhibit 13-8	3 7200	Yes
V _{FO}		Exhibit 13-8			$V_{FO} = V_{F}$	- V _R	6218	Exhibit 13-8	3 7200	No
					V _R		1175	Exhibit 13-1	0 2100	No
Flow Enter	ring Merge In	 nfluence Δ	rea			nterin	a Dive	rge Influen	ce Area	
	Actual		Desirable	Violation?		-	Actual	Max Desirat		Violation?
V _{R12}		Exhibit 13-8	2 0011 01 01 0		V ₁₂		415	Exhibit 13-8	4400:All	Yes
	ervice Deterr		if not E)					terminatio		
		•	,							7
	+ 0.00734 v _R +	0.0078 V ₁₂ -	0.00627 L _A					.0086 V ₁₂ - 0.	009 L _D	
	ni/ln)				D _R = 42	2.4 (pc	′mi/ln)			
	bit 13-2)				LOS = F	(Exhit	oit 13-2)			
					Speed L	Deter	minatio	on		
.OS = (Exhil	ermination					_				
.OS = (Exhile Speed Dete					D _s = 0.	404 (E	xhibit 13	-12)		
.OS = (Exhil Speed Dete / _S = (Exibi	it 13-11)				s.	-		-		
OS = (Exhit) Speed Dete $M_S = (Exibi)$ $B_R = mph (E)$	it 13-11) Exhibit 13-11)				S _R = 58	8.7 mph	(Exhibit	13-12)		
OS = (Exhit) Speed Dete $M_S = (Exib)$ $M_R = mph (E)$ $M_R = mph (E)$	it 13-11)				S _R = 58 S ₀ = 70	8.7 mph 0.2 mph		13-12) 13-12)		

	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	AECOM AM		Highway/Direction of Travel From/To Jurisdiction Analysis Year	I-95 NB Seg 8-B No-Build	et Off & On 10th St I 2020
Project Description SW 10th	Street SIMR				
✓ Oper.(LOS) Flow Inputs			Des.(N)		inning Data
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D	5850	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 Adjustm	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	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 I	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) 2083 61.0 34.2 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 hol	S - Speed D - Density FFS - Free-flow BFFS - Base fro	-	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11
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		RA	MPS AND	RAMP JUN	CTIONS W	ORKSHEE	ET			
General I	nformatio	n			Site Infor	mation				
Analyst				Fr	eeway/Dir of Tr	avel I-9	5 NB			
gency or Con		AEC	OM	Ju	inction	Se	g 9-On Ramp ′	10th St EB & WB		
ate Performe					irisdiction					
nalysis Time		AM		Ar	nalysis Year	No	b-Build 2020			
roject Descrip nputs	otion SW 10th	n Stree	t SIMR							
			Ereeway Num	ber of Lanes, N	3					
Jpstream Adj I	Ramp				J 1				Downstre Down	eam Adj
✓ Yes	On		Ramp Number		1				Ramp	
				ane Length, L _A	1345				🗌 Yes	🗌 On
No	✓ Off			ane Length L _D					✓ No	Off
			Freeway Volur	I	5850					
_{up} = 1	370 ft		Ramp Volume	, V _R	1460				L _{down} =	ft
/ _u = 1	070 veh/h		Freeway Free-	Flow Speed, S _{FF}	70.0				V _D =	veh/h
'u I			Ramp Free-Flo	ow Speed, S _{FR}	50.0				D	
Conversi	on to pc/h	l Und	der Base (Conditions						
(pc/h)	V		PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PH	F x f _{HV} x f _p
. ,	(Veh									'
Freeway Ramp	585 146		0.95 0.92	Level	3	0	0.985 0.990	1.00 1.00		6250 1603
UpStream	140		0.92	Level	2	0	0.990	1.00		1175
DownStream	107	0	0.92	Level	2	0	0.990	1.00		1175
Jownouroum			Merge Areas				[Diverge Areas		
stimatio	n of v_{12}					Estimatio	n of v ₁₂			
		_ = V_	(P _{FM})							
=				13-6 or 13-7)			•=	V _R + (V _F - V _R		
EQ =				ion (Exhibit 13-6)		L _{EQ} =		(Equation 13-		-
Р _{FM} = 7 _						P _{FD} =		using Equatio	n (Exhibit 1	3-7)
′ ₁₂ =		402		on 13-14 or 13-		V ₁₂ =		pc/h		
$'_3$ or V $_{\rm av34}$		7)	pc/ii (Equalic	JI 13-14 01 13-		$V_3^{}$ or $V_{av34}^{}$		pc/h (Equation 1	3-14 or 13-	17)
s V_3 or V_{av34}	> 2,700 pc/h?		s 🗌 No			Is V_3 or V_{av34} 2	> 2,700 pc/h? [Yes 🗌 No		
	> 1.5 * V ₁₂ /2					Is V_3 or V_{av34}	> 1.5 * V ₁₂ /2 [Yes No		
f Yes,V _{12a} =				on 13-16, 13-		lf Yes,V _{12a} =		pc/h (Equatio	n 13-16, 1	13-18, or
.24	1		13-19)					3-19)		
Capacity						Capacity	Checks			
	Act	ual	C	apacity	LOS F?		Actual		bacity	LOS F?
						V _F	_	Exhibit 13-8	_	
V_{FO}	78	53	Exhibit 13-8		Yes	V _{FO} = V _F - V	V _R	Exhibit 13-8	3	
						V _R		Exhibit 13-	·	
low Ent		no In	l l	<u></u>			ring Divo	10		<u> </u>
	Actu		fluence A	rea Desirable	Violation?		Actual	rge Influen Max Desi		Violation?
V _{R12}	517		Exhibit 13-8	4600:All	Yes	V ₁₂	, 101000	Exhibit 13-8		
			nination (i		100	·	Service De	terminatio	n (if not	<u> </u> t F)
			0.0078 V ₁₂ - 0.0	1		1		.0086 V ₁₂ - 0.	•	,
		'R''	12 - 0.0							
IX .	(pc/mi/ln)						mi/ln)			
	xhibit 13-2)						nibit 13-2)			
Speed De	eterminati	on				Speed De		on		
1 _S = 0.87	5 (Exibit 13-11)				ů i	ibit 13-12)			
6 _R = 45.5	mph (Exhibit 1	3-11)				S _R = mph (Exhibit 13-12)				
	mph (Exhibit 1	3-11)				S ₀ = mph (Exhibit 13-12)				
	mph (Exhibit 1	3-13)				S = mph	(Exhibit 13-13)			
t @ 2016 Iniv	ersity of Florida,		hts Posonvod			HCS2010 TM			Conorat	ed: 5/20/2019

General Information			Site Information		
Analyst Agency or Company Date Performed	AECOM		Highway/Direction of Travel From/To Jurisdiction	I-95 NB	
Analysis Time Period	AM		Analysis Year	No-Build	2020
Project Description SW 10th	n Street SIMR				
Oper.(LOS)			Des.(N)	Pla	nning Data
Flow Inputs					
Volume, V AADT	7310	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		ft			
Rt-Side Lat. Clearance		ft	f _{LW}		mph
Number of Lanes, N	3		f _{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			
LOS and Performance	Measures		Design (N)		
Operational (LOS)			Design (N)		
v _p = (V or DDHV) / (PHF x N x	(f _{HV} x f _p) 2603	pc/h/ln	Design LOS	c c >	
S	47.2	mph	v _p = (V or DDHV) / (PHF x N x	t _{HV} x t _p)	pc/h/ln
D = v _p / S	55.2	pc/mi/ln	S D = w / C		mph
LOS	F		D = v _p / S Required Number of Lanes, N		pc/mi/ln
Glossary			Factor Location		
N - Number of lanes	S - Speed		E _R - Exhibits 11-10, 11-12		f _{I W} - Exhibit 11-8
 Hourly volume 	D - Density		$E_{\rm R}$ - Exhibits 11-10, 11-11, 11-	13	f_{LW} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow	v speed	$f_{\rm p}$ - Page 11-18	10	
LOS - Level of service	BFFS - Base fre	ee-flow speed	P	2 11 2	TRD - Page 11-1
DDHV - Directional design ho	ur volume		LOS, S, FFS, v _p - Exhibits 11-2	2, 11-3	
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		RAMP	S AND RAM			ORKS	HEET			
General Inf	ormation			Site Infor						
Analyst			Fr	eeway/Dir of Tr	avel	I-95 NE	3			
Agency or Compa	any AEC	OM		inction		Seg 11	-Off Ramp	Hillsboro EB		
Date Performed	2. J			risdiction						
Analysis Time Pe			Ar	nalysis Year		No-Bui	ld 2020			
nputs	on SW 10th Stree	I SINK								
•		Freeway Num	ber of Lanes, N	3						
Upstream Ac	lj Ramp	Ramp Numbe		1					Downstrea Ramp	m Adj
✓ Yes	🗹 On	· ·		I					•	
			ane Length, L _A						Yes	🗌 On
No	Off		ane Length L _D	220					✓ No	Off
		Freeway Volu	1	7310					. –	
L _{up} =	3085 ft	Ramp Volume	, V _R	720					L _{down} =	ft
V -	1400	Freeway Free	-Flow Speed, S _{FF}	70.0					V _D =	veh/h
V _u =	1460 veh/h	Ramp Free-Fl	ow Speed, S _{FR}	45.0					·D	VCII/II
Conversior	n to pc/h Uno	der Base (Conditions							
(pc/h)	V	PHF	Terrain	%Truck	%Rv		f _{HV}	f _p	v = V/PHF	x funz x fu
. ,	(Veh/hr)	$ \downarrow $			ļ			P.		I.
Freeway	7310	0.95	Level	3	0	_	985	1.00	78	
Ramp	720	0.92	Level	2	0		990	1.00	79	
JpStream	1460	0.92	Level	2	0	0.	990	1.00	160	03
DownStream		Merge Areas						Diverge Areas		
Estimation		Merge Areas			Estimat	tion		Siverge Areas		
					Lotinut					
	V ₁₂ = V _F	(P _{FM})						• V _R + (V _F - V _F	5	
_{EQ} =	(Equa	ition 13-6 or	13-7)		L _{EQ} =		84	410.72 (Equation	on 13-12 o	r 13-13)
P _{FM} =	using	Equation (E	Exhibit 13-6)		P _{FD} =		0.	528 using Equ	uation (Exhib	oit 13-7)
/ ₁₂ =	pc/h				V ₁₂ =		44	199 pc/h		
V_3 or V_{av34}	pc/h (Equation 13	-14 or 13-17)		$V_3^{}$ or $V_{av34}^{}$		33	311 pc/h (Equ	ation 13-14	or 13-17
	2,700 pc/h? 🗌 Ye					_{/34} > 2,7	'00 pc/h? 🖪	🛛 Yes 🗌 No		
	.5 * V ₁₂ /2 Yes							Yes 🗹 No		
0 U.O.			-16, 13-18, or				. –	110 pc/h (Equa	ation 13-16	. 13-18.
f Yes,V _{12a} =	13-19)				If Yes,V _{12a} =		0	r 13-19) ``		
Capacity C	hecks				Capacit	ty Ch	ecks			
	Actual	C	apacity	LOS F?			Actual		pacity	LOS F
					V _F		7810	Exhibit 13-8	7200	Yes
V _{FO}		Exhibit 13-8			$V_{FO} = V_{F}$	- V _R	7020	Exhibit 13-8	7200	No
					V _R		790	Exhibit 13-1	2100	No
-low Enter	ing Merge In	fluence A	rea	-!	Flow Er	nterin	a Dive	rge Influen	ce Area	
	Actual		Desirable	Violation?			Actual	Max Desirab		Violation
V _{R12}		Exhibit 13-8			V ₁₂		1499	Exhibit 13-8	4400:All	Yes
	rvice Detern	nination (i	if not F)			f Ser	vice De	terminatio	n (if not l	=)
	0.00734 v _R +		,					.0086 V ₁₂ - 0.0	•	/
) _R = (pc/mi		12	A			к 6.2 (рс		12	D	
	oit 13-2)						-			
					Speed L	-	oit 13-2) minatio	<u></u>		
Speed Dete										
/I _S = (Exibi	t 13-11)				, and a second s	-	xhibit 13	-		
S _R = mph (E	Exhibit 13-11)						(Exhibit	-		
S ₀ = mph (E	Exhibit 13-11)				S ₀ = 70.2 mph (Exhibit 13-12)					
	Exhibit 13-13)				S = 62	2.9 mph	(Exhibit	13-13)		

	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	AECOM AM		Highway/Direction of Travel From/To Jurisdiction Analysis Year	I-95 NB Seg 12-I No-Build	Bet Off & On Hillsbord 1 2020
Project Description SW 10th	i Street SIMR		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	6590	veh/h veh/day veh/h	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade % Length Up/Down %	0.95 3 0 Level mi	
Calculate Flow Adjustm	nents		-p		
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 I	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) 2347 54.7 42.9 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 hol	S - Speed D - Density FFS - Free-flow BFFS - Base fro ur volume	-	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11
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Gener	al Information	on			Site Info	ormation			
Analyst Agency/C Date Perf Analysis		AECON AM	I		Freeway/Dir Weaving Se Analysis Yea	gment Locati	•	NB 3-Bet On & (uild 2020	Off Hillsboro
Project De Inputs	escription SW 10t	h Street SIMR							
Weaving Weaving Weaving	configuration number of lanes, N segment length, L free-flow speed, Fl	3		One-Sided 4 790ft 70 mph		nimum speed Iximum capao			Free 2
Conve	ersions to po	c/h Under	[•] Base Co	onditions					
	V (veh/h)	PHF	Truck (%)	RV (%)	Ε _Τ	E _R	f_{HV}	fp	v (pc/h
V _{FF}	6000	0.95	3	0	1.5	1.2	0.985	1.00	6411
V _{RF}	560	0.92	2	0	1.5	1.2	0.990	1.00	615
V _{FR}	590	0.92	2	0	1.5	1.2	0.990	1.00	648
V _{RR}	0	0.95	2	0	1.5	1.2	0.990	1.00	0
V _{NW}	6411				•	•		V =	7674
V _W	1263								
VR	0.165								
Config	guration Cha	aracterist	ics						
Minimum	maneuver lanes, l	N _{WL}		2 lc	Minimum we	eaving lane c	hanges, LC _{MIN}	1	1263
Interchan	ige density, ID			0.7 int/mi	Weaving lar	ne changes, l	_C _w		1474
Minimum	RF lane changes,	$\mathrm{LC}_{\mathrm{RF}}$		1 lc/pc	Non-weavin	g lane chang	jes, LC _{NW}		978
Minimum	FR lane changes,	$\rm LC_{FR}$		1 lc/pc	Total lane c	hanges, LC _{AL}	L		2452
Minimum	RR lane changes	, LC _{RR}		lc/pc	Non-weavin	g vehicle ind	ex, I _{NW}		:
Weavi	ng Segment	t Speed, I	Density, I	Level of	Service,	and Ca	pacity		
Weaving	segment flow rate	, V		7566 veh/h	Ŭ	ensity factor,			0.
Weaving	segment capacity,	, c _w		8437 veh/h	-	gment speed			51.5 r
v	segment v/c ratio			0.897	-	aving speed,	**		50.4 r
-	segment density,	D	3	•	-	n-weaving sp			51.7 r
	Service, LOS			E	Maximum w	eaving lengtl	h, L _{MAX}		417
Notes						,		·	<u> </u>
Chapter 1	g segments longer tl 3, "Freeway Merge a	and Diverge Seg	gments".	-		solated merge	e and diverge ar	eas using the	procedures
	imes that exceed the ersity of Florida, All	<u> </u>		he level of ser	vice is "F".				

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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	l-95 NB Seg 14- No-Build	Bet Off & On Hillsbord 1 2020
Project Description SW 10th	n Street SIMR		Des.(N)		anning Data
Flow Inputs			Des.(IV)		
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D	6560	veh/h veh/day veh/h	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade % Length Up/Down %	0.95 3 0 Level mi	
Calculate Flow Adjustn	nents		·		
f _p Ε _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 > S D = v _p / S LOS	x f _{HV} x f _p) 2336 55.0 42.4 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 fro ur volume	-	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11
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			REEWA	WEAV		_	1		
Genera	I Informati	on			Site Info	rmation			
-	rmed me Period	AECO AM			Freeway/Dir Weaving Seg Analysis Yea	gment Locati		IB 5-Bet On & C uild 2020	Off to Exp
Project Des Inputs	scription SW 10t	th Street SIM	२						
Weaving n Weaving se Freeway fr	onfiguration umber of lanes, I egment length, L ee-flow speed, F	s FS	r Base Co	Two-Sided 3 4665ft 70 mph	Segment typ Freeway min Freeway ma: Terrain type	imum speed			Freewa 24(Lev
CONVEN	V (veh/h)	PHF	Truck (%)	RV (%)	E _T	E _R	f _{HV}	fp	v (pc/h)
V _{FF}	5275	0.95	3	0	1.5	1.2	0.985	1.00	5636
V _{RF}	635	0.92	2	0	1.5	1.2	0.990	1.00	697
V _{FR}	1285	0.92	2	0	1.5	1.2	0.990	1.00	1411
V _{RR}	75	0.92	2	0	1.5	1.2	0.990	1.00	82
V _{NW}	7744							V =	7826
V _W	82								
VR	0.010								
Config	uration Cha	aracteris	tics		_				
Minimum r	maneuver lanes,	N _{WL}		0 lc	Minimum we	aving lane c	hanges, LC _{MIN}		lc
Interchang	e density, ID			0.7 int/mi	Weaving lan	e changes, L	-C _w		lc
Minimum F	RF lane changes	, LC _{RF}		0 lc/pc	Non-weaving	g lane chang	es, LC _{NW}		lc
Minimum F	R lane changes	, LC _{FR}		0 lc/pc	Total lane ch	nanges, LC _{AL}	L		lc
Minimum F	RR lane changes	, LC _{RR}		3 lc/pc	Non-weaving	g vehicle inde	ex, I _{NW}		
Weavir	ng Segmen	t Speed,	Density,	Level of	Service,	and Cap	pacity		
•	egment flow rate			7722 veh/h 6831 veh/h	Weaving inte Weaving seg	•			mp
	egment v/c ratio	, • _W		1.130	Average wea	aving speed,	S _w		mp
•	egment density,	D		pc/mi/ln	Average nor	n-weaving sp	eed, S _{NW}		mp
-	ervice, LOS			F	Maximum w				5824
Notes							WIEWY		

Chapter 13, "Freeway Merge and Diverge Segments". b. For volumes that exceed the weaving segment capacity, the level of service is "F".

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	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	AECOM AM		Highway/Direction of Travel From/To Jurisdiction Analysis Year	l-95 NB Seg 16- No-Build	North of Hillsboro I 2040
Project Description SW 10th	n Street SIMR		Des.(N)		nning Data
Flow Inputs			Des.(III)		anning Data
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D	5910	veh/h veh/day veh/h	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade % Length Up/Down %	0.95 4 0 Level mi	
Calculate Flow Adjustn	nents				
f _p E _T	1.00 1.5		E _R f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	1.2 0.980	
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 _{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		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	·	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 frour volume	-	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11
DDHV - Directional design ho	ur volume	ee-now speed	LOS, S, FFS, v_p - Exhibits 11-		enerated: 5/20/2019

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_			REEWA	WEAV		_			
Genera	l Informati	on			Site Info	rmation			
Analyst Agency/Co Date Perfor Analysis Tir	med me Period	AECO PM			Freeway/Dir Weaving Seg Analysis Yea	gment Locati		IB -Bet Copans ıild 2020	& Sample
^p roject Des I nputs	scription SW 101	h Street SIM	2						
Weaving nu Weaving se Freeway fre	onfiguration umber of lanes, I egment length, L ee-flow speed, F sions to p	s FS	r Base Co	One-Sided 4 1820ft 70 mph	Segment typ Freeway min Freeway ma: Terrain type	imum speed			Freewa 240 Lev
	V (veh/h)	PHF	Truck (%)	RV (%)	Б Т	E _R	f _{HV}	fp	v (pc/h)
V _{FF}	4400	0.95	3	0	1.5	1.2	0.985	1.00	4701
V _{RF}	410	0.92	2	0	1.5	1.2	0.990	1.00	450
V _{FR}	1570	0.92	2	0	1.5	1.2	0.990	1.00	1724
V _{RR}	0	0.92	0	0	1.5	1.2	1.000	1.00	0
V _{NW}	4701		8					V =	6875
V _W	2174								<u>.</u>
/R	0.316								
Configu	uration Cha	aracteris	tics		-				
Minimum n	naneuver lanes,	N _{WL}		2 lc	Minimum we	aving lane c	hanges, LC _{MIN}		2174 lc
Interchang	e density, ID			0.7 int/mi	Weaving lan	e changes, L	_C _w		2546 lc
Minimum F	RF lane changes	, LC _{rf}		1 lc/pc	Non-weaving	g lane chang	es, LC _{NW}		1184 lc
Minimum F	R lane changes	, LC _{FR}		1 lc/pc	Total lane ch	nanges, LC _{AL}	L		3730 lc
Minimum F	R lane changes	, LC _{RR}		lc/pc	Non-weaving	g vehicle inde	ex, I _{NW}		59
Weavin	g Segmen	t Speed,	Density, I	Level of	Service,	and Cap	pacity		
Weaving s	egment flow rate	e, V		6784 veh/h	Weaving inte				0.39
Weaving s	egment capacity	, c _w		7478 veh/h	Weaving seg				48.4 mp
•	egment v/c ratio			0.907	Average wea	• •	**		54.3 mp
-	egment density,	D	3	5.5 pc/mi/ln	Average nor				46.1 mp
Level of Se	ervice, LOS			E	Maximum w	eaving length	n, L _{MAX}		5759

Chapter 13, "Freeway Merge and Diverge Segments". b. For volumes that exceed the weaving segment capacity, the level of service is "F".

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	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst	45004		Highway/Direction of Travel	I-95 NB Seg 2-Bet	Off & On from
Agency or Company Date Performed Analysis Time Period	AECOM PM		Jurisdiction Analysis Year	Sample No-Build 2	2020
Project Description SW 10th	h Street SIMR		,		
Oper.(LOS)			Des.(N)	Plan	ning Data
Flow Inputs					•
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D	4810	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	
			Up/Down %		
Calculate Flow Adjustn	nents				
f _p	1.00		E _R	1.2	
Έ _Τ	1.5		[–] R f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.985	
Speed Inputs			Calc Speed Adj and FFS		
•		4		<i>.</i>	
Lane Width Rt-Side Lat. Clearance		ft ft	f		mph
Number of Lanes, N	3	п	f _{LW} f _{LC}		mph
Total Ramp Density, TRD	5	ramps/mi	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)		
Operational (LOS)			Design (N)		
v _p = (V or DDHV) / (PHF x N > S D = v _p / S LOS	x f _{HV} x f _p) 1713 66.9 25.6 C	pc/h/ln mph pc/mi/ln	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	-	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	f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11
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		RAI	MPS AND	RAMP JUN	CTIONS W	ORKSHE	ET				
Genera	l Infor	nation			Site Infor	mation					
Analyst				Fre	eeway/Dir of Tr	avel I-	-95 N	В			
gency or (AECO	MC		nction	S	Seg 3-	On Ramp fr	om Sample		
ate Perfor					risdiction						
	me Period	PM		An	alysis Year	N	√o-Bu	ild 2020			
roject Des nputs	scription	SW 10th Stree	t SIMR								
			Freeway Num	ber of Lanes, N	3					1	
Jpstream A	Adj Ramp		· ·		1					Downstre	eam Adj
Yes	🗌 On		Ramp Numbe		1					Ramp	
				ane Length, L _A	500					🗹 Yes	🗹 On
✓ No	🗌 Off			ane Length L _D						🗌 No	Off
			Freeway Volu		4810						4050 8
up =	ft		Ramp Volume	i v	970					L _{down} =	1950 ft
/ _u =	veh/h		Freeway Free	-Flow Speed, S _{FF}	70.0					V _D =	730 veh/h
u	veniin		Ramp Free-Fl	ow Speed, S _{FR}	50.0					U	
Conver	rsion to	o pc/h Und	der Base	Conditions							
(pc/	/h)	V () (= h /h = r)	PHF	Terrain	%Truck	%Rv		f _{HV}	f _p	v = V/PH	F x f _{HV} x f _p
reeway	,	(Veh/hr) 4810	0.95	Level	3	0	_	.985	1.00		5139
Ramp		970	0.95	Level	2	0		.985	1.00		1065
JpStream		510	0.52	Levei	2	0		.330	1.00		1005
DownStrea	am	730	0.92	Level	2	0	0	.990	1.00		801
			Merge Areas		<u>I</u>			D	iverge Areas	8	
stima	tion of	V ₁₂				Estimatio	on c	of v ₁₂			
		V ₁₂ = V _F	(P _{EM})							<u>, </u>	
EQ =			tion 13-6 o	r 13-7)					/ _R + (V _F - V _R		
EQ /FM =				tion (Exhibit 13-6)		L _{EQ} =			Equation 13-		-
^r 12 =		3040 p	• ·			P _{FD} =			sing Equatio	n (Exhibit 1	13-7)
				on 13-14 or 13-		V ₁₂ =			c/h		
V_3 or V_{av34}		17)				$V_3^{}$ or $V_{av34}^{}$	_	-	c/h (Equation 1	3-14 or 13-	17)
s V_3 or V_a	_{v34} > 2,700) pc/h? 🗌 Yes	s 🗹 No						Yes 🗌 No		
s V_3 or V_a	_{v34} > 1.5 *	V ₁₂ /2 Ves	s 🗌 No			Is V ₃ or V _{av34}	₄ > 1.5		Yes No	10.10	
Yes,V _{12a}	=			on 13-16, 13-		lf Yes,V _{12a} =			c/h (Equatio -19)	n 13-16, ′	13-18, or
120		18, or	13-19)			O a m a a itu	. 04		10)		
зараст	ty Che):t		Capacity			0	!	
		Actual		Capacity	LOS F?	V _F		Actual	Exhibit 13-	bacity	LOS F?
						· · · · · ·	<u>, v</u>		_	_	_
V _F	0	6204	Exhibit 13-8		No	$V_{FO} = V_{F}$ -	• v _R		Exhibit 13-		
						V _R			Exhibit 13 10	-	
low E	nterina	Merge In	fluence A	rea		Flow Enf	terir	na Diver	ge Influen	ce Area	 7
		Actual	II.	Desirable	Violation?		II.	Actual	Max Desi		Violation?
V _R	12	4105	Exhibit 13-8	4600:All	No	V ₁₂			Exhibit 13-8		
		ce Detern	nination (if not F)	1	Level of	Ser	vice Det	terminatio	n (if no	t F)
		0.00734 v _R + 0		,		-			0086 V ₁₂ - 0		
	3.9 (pc/mi	••	12	~			r c/mi/l		12	U	
) (Exhibit 1	,						t 13-2)			
		nination				Speed D		-	n		
						1					
•).508 (Exib							13-12) hihit 12 12)			
		Exhibit 13-11)					•	hibit 13-12)			
•	• •	Exhibit 13-11)				, i i i i i i i i i i i i i i i i i i i	•	hibit 13-12)			
		Exhibit 13-13)						hibit 13-13)			
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General Information			Site Information		
Analyst			Highway/Direction of Travel	1-95 NB	t On from Somple
Agency or Company	AECOM		From/To	Зеу 4-ве Ехр	et On from Sample &
Date Performed Analysis Time Period	PM		Jurisdiction Analysis Year	No-Build	2020
Project Description SW 10th				NO-Dulla	2020
✓ Oper.(LOS)			Des.(N)	Plar	nning Data
Flow Inputs			200.(11)		
Volume, V	5780	veh/h	Peak-Hour Factor, PHF	0.95	
AADT	0,00	veh/day	%Trucks and Buses, P_{T}	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 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		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		10.0	mpn
LOS and Performance I	Maggurag		Design (N)		
	wiedsuies				
Operational (LOS)			<u>Design (N)</u> Design LOO		
v _p = (V or DDHV) / (PHF x N x	(f _{HV} x f _n) 2058	pc/h/ln	Design LOS	<i>c c</i> ,	
S	61.5	mph	v _p = (V or DDHV) / (PHF x N x	f _{HV} x f _p)	pc/h/ln
$D = v_p / S$	33.5	pc/mi/ln	S		mph
LOS	D	portini	$D = v_p / S$		pc/mi/ln
	D		Required Number of Lanes, N		
Glossary			Factor Location		
N - Number of lanes	S - Speed				
V - Hourly volume	D - Density		E _R - Exhibits 11-10, 11-12	40	f _{LW} - Exhibit 11-8
v _p - Flow rate	FFS - Free-flow	speed	E _T - Exhibits 11-10, 11-11, 11-	13	f _{LC} - Exhibit 11-9
LOS - Level of service	BFFS - Base fre	-	f _p - Page 11-18		TRD - Page 11-11
DDHV - Directional design ho			LOS, S, FFS, v _p - Exhibits 11-	2, 11-3	
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		RA		RAMP JUN	CTIONS W	ORKSHE	ET				
General	Inform	nation			Site Infor	mation					
Analyst				Fr	eeway/Dir of Tr	avel I-	-95 NE	3			
gency or Co		AECO	MC	Ju	inction	S	Seg 5-	On from Ex)		
ate Perform					irisdiction						
nalysis Tim		PM		Ar	nalysis Year	N	lo-Bui	ld 2020			
	cription S	SW 10th Street	t SIMR								
nputs				ber of Lanes, N	3						
Jpstream Ac	dj Ramp		· ·							Downstre	eam Adj
Yes	On		Ramp Numbe		1					Ramp	
				ane Length, L _A	600					🗹 Yes	🗌 On
✓ No	Off		Deceleration I	_ane Length L _D						🗌 No	✓ Off
			Freeway Volu	me, V _F	5780						
up =	ft		Ramp Volume	e, V _R	730					L _{down} =	5545 ft
	- I- <i>(</i>)-		Freeway Free	-Flow Speed, S _{FF}	70.0					V _D =	1200 vob/b
/ _u =	veh/h		Ramp Free-Fl	ow Speed, S _{FR}	50.0					v _D –	1300 veh/h
Convers	sion to	pc/h Und	ler Base	Conditions							
	r	V	PHF	Terrain	%Truck	%Rv		f	f	v = V/РН	F x f _{HV} x f _p
(pc/h)	(Veh/hr)		Terrain				f _{HV}	f _p		I ∧ HV ∧ Ip
Freeway		5780	0.95	Level	3	0	0.	.985	1.00		6175
Ramp		730	0.92	Level	2	0	0.	.990	1.00		801
JpStream											
DownStream	n	1300	0.92	Level	2	0	0.	.990	1.00		1427
Totimoti	ion of		Merge Areas			Ectimotic	<u></u>	U	iverge Areas		
stimati	011 01					Estimatio		12			
		V ₁₂ = V _F	(P _{FM})					V ₁₂ = \	/ _R + (V _F - V _R		
EQ =		8210.59	(Equation	13-6 or 13-7)		L _{EQ} =			Equation 13-		13)
P _{FM} =		0.616	using Equat	ion (Exhibit 13-6)	1	P _{FD} =			sing Equatio		-
/ ₁₂ =		3806 p	oc/h			V ₁₂ =			c/h		101)
V_3 or V_{av34}		2369 p	oc/h (Equati	on 13-14 or 13-						2 11 or 12	17)
		17)				V ₃ or V _{av34}	× 0 7		c/h (Equation 1	3-14 01 13-	.17)
		pc/h? 🗌 Yes							Yes No		
ls V ₃ or V _{av3}	₃₄ > 1.5 * '	V ₁₂ /2 🔽 Yes	s 🗌 No			IS V ₃ or V _{av34}	1 > 1.5		Yes No	- 10 10	10.10
f Yes,V _{12a} =				on 13-16, 13-		If Yes,V _{12a} =			c/h (Equation -19)	1 13-16,	13-18, 01
124		18, or	13-19)			Canaaitu	ch		,		
Capacity				`anasitu	LOS F?	Capacity			Car	a aitr	
		Actual		apacity	LUSF?	V _F		Actual	Exhibit 13-8	bacity	LOS F?
						· · · ·			_	_	_
V_{FC})	6976	Exhibit 13-8		No	V _{FO} = V _F -	· v _R		Exhibit 13-8	_	_
						V _R			Exhibit 13- 10	-	
low En	torina	Merge In	fluence (roa		Elow Ent	torin	a Divor	ge Influen	Co Area	<u> </u>
		Actual	II.	Desirable	Violation?		II.	Actual	Max Desi		Violation?
V _{R12}		5063	Exhibit 13-8	4600:All	Yes	V ₁₂			Exhibit 13-8		
		ce Detern			100		Ser	vice Dei	erminatio	n (if no	<u> </u> <i>t F</i>)
).00734 v _R + 0		,					0086 V ₁₂ - 0.		
			1.0070 v ₁₂ - 0.						0000 v ₁₂ - 0.	UU9 LD	
).8 (pc/mi/	,					c/mi/l	-			
	(Exhibit 1	,						: 13-2)			
Speed D	Determ	ination				Speed D	eter	minatio	n		
1 _S = 0.8	877 (Exib	it 13-11)				D _s = (Ex	hibit 1	3-12)			
-		Exhibit 13-11)				S _R = mpl	h (Exh	nibit 13-12)			
		Exhibit 13-11)					h (Exh	nibit 13-12)			
		Exhibit 13-13)					•	nibit 13-13)			
		Florida, All Righ	to Bosoniad			HCS2010 TM				Conorat	ed: 5/20/2019

	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 NB Seg 6-Be No-Build	et Exp On & Off to 10th I 2020
Project Description I-95 AT	HILLSBURU BU		Des.(N)	- Pla	Inning Data
Flow Inputs			263.(14)		
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D	6510	veh/h veh/day veh/h	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade % Length Up/Down %	0.95 3 0 Level mi	
Calculate Flow Adjustn	nents				
f _p E _T	1.00 1.5		E _R f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	1.2 0.985	
Speed Inputs			Calc Speed Adj and FFS	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 _{LW} f _{LC} TRD Adjustment FFS	70.0	mph mph mph mph
LOS and Performance	Veasures		Design (N)		
<u>Operational (LOS)</u> v _p = (V or DDHV) / (PHF x N > S D = v _p / S LOS	t f _{HV} x f _p)2318 55.5 41.8 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 frour ur volume	-	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11
DDHV - Directional design ho Copyright © 2016 University of Florida, A			HCS 2010 TM Version 6.90		enerated: 5/20/2019 12:09

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		RAMP	S AND RAM	P JUNCTI	ONS WC	ORKS	HEET			
General Info	rmation			Site Infor	mation					
Analyst			Fre	eeway/Dir of Tr	avel	I-95 NE	1			
Agency or Company	y AEC	OM		inction		Seg 7-0	Off Ramp t	o 10th St		
Date Performed				risdiction						
Analysis Time Peric			An	nalysis Year		No-Bui	d 2020			
Project Description	SW 10th Stree	I SIMR								
•		Eroowov Num	ber of Lanes, N	3						
Upstream Adj I	Ramp			3					Downstrea	m Adj
Yes	On	Ramp Numbe		1					Ramp	
		Acceleration L	ane Length, L _A						🗹 Yes	🗹 On
✓ No	Off	Deceleration L	ane Length L _D	250					No	Off
		Freeway Volu	me, V _F	6510						
L _{up} =	ft	Ramp Volume	, V _R	1300					L _{down} =	1370 ft
		Freeway Free	-Flow Speed, S _{FF}	70.0					V -	4400
V _u =	veh/h	-	ow Speed, S _{FR}	45.0					V _D =	1160 veh
Conversion	to nc/h Un	-								
								ſ		
(pc/h)	(Veh/hr)	PHF	Terrain	%Truck	%Rv		f _{HV}	f _p	v = V/PHF	x t _{HV} x t _p
Freeway	6510	0.95	Level	3	0	0.	985	1.00	695	55
Ramp	1300	0.92	Level	2	0	0.	990	1.00	142	27
JpStream										
DownStream	1160	0.92	Level	2	0	0.	990	1.00	127	73
		Merge Areas						Diverge Areas		
Estimation o	of v ₁₂				Estimat	tion o	f v ₁₂			
	V ₁₂ = V _F	(P _{FM})					V ₁₂ =	· V _R + (V _F - V _F	R)P _{FD}	
eq =	(Equa	ation 13-6 or	13-7)		L _{EQ} =		(Equation 13-1	2 or 13-13)	
2 = 2 = 2 = 2 = 2 = 2 = 2 = 2 = 2 = 2 =		Equation (E			P _{FD} =		0.	520 using Equ	uation (Exhib	oit 13-7)
/ ₁₂ =	pc/h	I V	,		$V_{12} =$			304 pc/h	(/
V_3 or V_{av34}	•	Equation 13	-14 or 13-17)		V_3 or V_{av34}			651 pc/h (Equ	ation 13-14	or 13-17
s V ₃ or V _{av34} > 2,7						> 2 7		Yes ⊡ No		0110-17
s V ₃ or V _{av34} > 1.5			-16, 13-18, or				. –	Yes 🗹 No c/h (Equation	13-16 13-	18 or 13
Yes,V _{12a} =	13-19		10, 10-10, 01		If Yes,V _{12a}	=	۲ 1		15-10, 15-	10, 01 13-
Capacity Ch	ecks				Capacit	ty Ch	ecks			
	Actual	C	apacity	LOS F?			Actual	Ca	pacity	LOS F
					V _F		6955	Exhibit 13-8	7200	No
V _{FO}		Exhibit 13-8			$V_{FO} = V_{FO}$	V _P	5528	Exhibit 13-8	7200	No
10					V _R		1427	Exhibit 13-1	2100	No
	<u>I</u>	<u> </u>						rge Influen		110
low Entorin		muence A		•	110W LI	ii'	Actual	Max Desirab		Violation
low Enterin			Desirable	Violation?						
	Actual	Max	Desirable	Violation?	V.					
V _{R12}	Actual	Max Exhibit 13-8		Violation?	V ₁₂	4	304	Exhibit 13-8	4400:All	No
V _{R12} .evel of Serv	Actual	Max I Exhibit 13-8 mination (i	if not F)	Violation?	Level o	4 f Serv	304 /ice De	Exhibit 13-8 terminatio	4400:All n (if not F	No
V _{R12} .evel of Serv D _R = 5.475 + 0	Actual vice Detern 0.00734 v _R +	Max I Exhibit 13-8 mination (i	if not F)	Violation?	Level o	4 f Serv D _R = 4	304 / ice De .252 + 0	Exhibit 13-8	4400:All n (if not F	No
V _{R12} .evel of Serv D _R = 5.475 + 0 P _R = (pc/mi/li	Actual vice Deterr 0.00734 v _R + n)	Max I Exhibit 13-8 mination (i	if not F)	Violation?	Level o	4 f Serv D _R = 4 9.0 (pc/	304 / ice De 252 + 0 /mi/ln)	Exhibit 13-8 terminatio	4400:All n (if not F	No
V _{R12} .evel of Serv D _R = 5.475 + 0 D _R = (pc/mi/li OS = (Exhibit	Actual vice Detern 0.00734 v _R + n) t 13-2)	Max I Exhibit 13-8 mination (i	if not F)	Violation?	Level o	4 f Serv D _R = 4 9.0 (pc/	304 / ice De .252 + 0	Exhibit 13-8 terminatio	4400:All n (if not F	No
V _{R12} .evel of Serv D _R = 5.475 + 0 D _R = (pc/mi/li OS = (Exhibit	Actual vice Detern 0.00734 v _R + n) t 13-2)	Max I Exhibit 13-8 mination (i	if not F)	Violation?	Level o	4 f Serv D _R = 4 9.0 (pc/ E (Exhit	304 •.252 + 0 (mi/ln) bit 13-2)	Exhibit 13-8 termination .0086 V ₁₂ - 0.	4400:All n (if not F	No
V_{R12} Level of Serv $D_R = 5.475 + 0$ $D_R = (pc/mi/lit)$ OS = (Exhibit) Speed Deterv	Actual vice Detern 0.00734 v _R + n) 13-2) mination	Max I Exhibit 13-8 mination (i	if not F)	Violation?	Level o D _R = 3 LOS = E Speed I	f Serv D _R = 4 9.0 (pc/ (Exhite Deterr	304 •.252 + 0 (mi/ln) bit 13-2)	Exhibit 13-8 termination .0086 V ₁₂ - 0.1	4400:All n (if not F	No
V_{R12} Level of Serv $D_{R} = 5.475 + 0$ $D_{R} = (pc/mi/loc)$ $OS = (Exhibit)$ Speed Detern $M_{S} = (Exibit)$	Actual vice Detern 0.00734 v _R + n) 13-2) mination 13-11)	Max I Exhibit 13-8 mination (i	if not F)	Violation?	$Level o$ $D_{R} = 3$ $LOS = E$ $Speed I$ $D_{s} = 0$	<i>f</i> Serv D _R = 4 9.0 (pc/ (Exhite Deterr .426 (E:	/304 / 252 + 0 /mi/ln) oit 13-2) minatic	Exhibit 13-8 termination .0086 V ₁₂ - 0. on .12)	4400:All n (if not F	No
V_{R12} $D_{R} = 5.475 \pm 0$ $D_{R} = (pc/mi/li)$ $OS = (Exhibit)$ $Speed Deter$ $M_{S} = (Exibit)$ $M_{R} = mph (Ex)$	Actual vice Detern 0.00734 v _R + n) 13-2) mination 13-11) thibit 13-11)	Max I Exhibit 13-8 mination (i	if not F)	Violation?	$Level o$ $D_{R} = 3$ $LOS = E$ $Speed I$ $D_{s} = 0$ $S_{R} = 5$	4 f Serv D _R = 4 9.0 (pc) : (Exhit Deterr .426 (E: 8.1 mph	304 <u>vice De</u> .252 + 0 (mi/ln) bit 13-2) minatic xhibit 13- (Exhibit	Exhibit 13-8 termination .0086 V ₁₂ - 0. on .12) 13-12)	4400:All n (if not F	No
V_{R12} Evel of Serv $D_R = 5.475 + 0$ $P_R = (pc/mi/li OS = (Exhibit)$ Speed Detern $P_S = (Exibit)$ $P_S = (Exibit)$ $P_R = mph (Ex)$ $P_R = mph (Ex)$	Actual vice Detern 0.00734 v _R + n) 13-2) mination 13-11)	Max I Exhibit 13-8 mination (i	if not F)	Violation?	Level o $D_R = 3$ LOS = E Speed I $D_s = 0$ $S_R = 5$ $S_0 = 7$	f Serv D _R = 4 9.0 (pc/ (Exhite (Exhite A26 (E: 8.1 mph 0.4 mph	304 •.252 + 0 ·mi/ln) bit 13-2) minatic xhibit 13•	Exhibit 13-8 termination .0086 V ₁₂ - 0.0 on .12) 13-12) 13-12)	4400:All n (if not F	No

te Information hway/Direction of Travel <i>I-95 NB</i> m/To Seg 8-Bet Off & On 10th St isdiction No-Build 2020 N) Planning Data ak-Hour Factor, PHF 0.95 rucks and Buses, PT 3 XVs, PR 0 neral Terrain: Level ade % Up/Down % 1.2 Image: the speed Adj and FFS 0.985 mode Mathematical Additional Additiona A
m/ToSeg 8-Bet Off & On 10th Stisdiction alysis YearNo-Build 2020N)Planning Dataak-Hour Factor, PHF 0.95 rucks and Buses, PTak-Hour Factor, PHF 0.985 ade $\%$ Length up/Down $\%$ 1.2 $ruck = 1/[1+P_T(E_T-1)+P_R(E_R-1)]0.985ade State Adj and FFS$
ak-Hour Factor, PHF 0.95 rucks and Buses, P_T 3 RVs, P_R 0 neral Terrain: Level ade % Length mi Up/Down % 1.2 $f = 1/[1+P_T(E_T-1)+P_R(E_R-1)]$ 0.985 IC Speed Adj and FFS
ak-Hour Factor, PHF 0.95 rucks and Buses, P_T 3 RVs, P_R 0 neral Terrain: Level ade % Length mi Up/Down % 1.2 $f = 1/[1+P_T(E_T-1)+P_R(E_R-1)]$ 0.985 IC Speed Adj and FFS
Inclusion3Inclusion P_T 3Inclusion0InclusionLevelInclusionInclusionInclusion1.2Inclusion0.985Inclusion0.985
1.2 $y = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$ 0.985 Ilc Speed Adj and FFS
$v = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$ 0.985
, mph
r mph RD Adjustment mph S 70.0 mph
esign (N)
sign (N) sign LOS = (V or DDHV) / (PHF x N x f _{HV} x f _p) pc/h/ln mph = v _p / S pc/mi/ln quired Number of Lanes, N
ctor Location
- Exhibits 11-10, 11-12 f _{LW} - Exhibit 11-8 - Exhibits 11-10, 11-11, 11-13 f _{LC} - Exhibit 11-9 Page 11-18 TRD - Page 11-1

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General Inf			RAMP JUN	Site Infor					
Analyst	Simation		Er	eeway/Dir of Ti		-95 NB			
Agency or Compa	anv ∧⊏r	СОМ		inction		-95 NB Seg 9-On Ramp		NB	
Date Performed				irisdiction	č	bey σ-οτι κατιτρ			
Analysis Time Pe	riod PM			nalysis Year	No-Build 2020				
	on SW 10th Stre		7.0						
Inputs									
		Freeway Num	ber of Lanes, N	3					
Upstream Adj Ra	mp	Ramp Numbe		1				Downstream Adj Ramp	
✓ Yes	On			1					
			ane Length, L _A	1345				Yes On	
🗌 No 🛛 🗹	Off	Deceleration L	_ane Length L _D					🗹 No 📃 Off	
		Freeway Volu	me, V _F	5210					
L _{up} = 137	0 ft	Ramp Volume	e, V _R	1160				L _{down} = ft	
		Freeway Free	-Flow Speed, S _{FF}	70.0					
V _u = 130	0 veh/h		ow Speed, S _{FR}	50.0				V _D = veh/h	
Conversion	n to pc/h Un								
				0/ T 1	0/ P	4	6		
(pc/h)	(Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x	
Freeway	5210	0.95	Level	3	0	0.985	1.00	5566	
Ramp	1160	0.92	Level	2	0	0.990	1.00	1273	
UpStream	1300	0.92	Level	2	0	0.990	1.00	1427	
DownStream									
		Merge Areas		-	Diverge Areas				
Estimation	of v ₁₂				Estimati	on of v ₁₂			
	V ₄₀ = V	(P _{FM})						() 5	
=			13-6 or 13-7)			V ₁₂ =	۰ V _R + (V _F - ۱		
L _{EQ} = P -			-		L _{EQ} =		(Equation 1	3-12 or 13-13)	
P _{FM} =			ion (Exhibit 13-6))	P _{FD} =		using Equa	tion (Exhibit 13-7)	
V ₁₂ =		pc/h			V ₁₂ =		pc/h		
$V_3^{}$ or $V_{av34}^{}$		pc/h (Equation	on 13-14 or 13-		$V_3^{}$ or $V_{av34}^{}$		pc/h (Equatio	n 13-14 or 13-17)	
	17) 2,700 pc/h? <u> </u>					₄ > 2,700 pc/h?	Yes N	0	
						, 1.5 * V ₁₂ /2			
	I.5 * V ₁₂ /2 √ Y					4		ion 13-16, 13-18, or	
lf Yes,V _{12a} =		pc/h (Equation r 13-19)	on 13-16, 13-		If Yes,V _{12a} =		13-19)	,,,,	
Capacity C		1 10 10)			Capacity	Checks			
	Actual	0	apacity	LOS F?		Actua		Capacity LOS	
					V _F		Exhibit 1		
					· · ·				
V _{FO}	6839	Exhibit 13-8		No	$V_{FO} = V_{F}$	^v R	Exhibit 1		
					V _R		Exhibit 1 10	3-	
Elow Enter	ing Merge I	nfluence A	roa		Flow En	tering Dive		nco Aroa	
	Actual		Desirable	Violation?		Actual		esirable Violati	
V _{R12}	4453	Exhibit 13-8	4600:All	No	V ₁₂		Exhibit 13-8		
	rvice Deter					Service D		ion (if not F)	
	5 + 0.00734 v _R +		/		-	0 _R = 4.252 + 0			
_		0.0070 v ₁₂ - 0.0					0.0000 v ₁₂ -	0.003 LD	
	c/mi/ln)					c/mi/ln)			
LOS = D (Exh	ibit 13-2)					xhibit 13-2)			
	ermination				Speed D	eterminati	on		
Speed Dete					D _s = (Ex	hibit 13-12)			
	Exibit 13-11)				1-				
M _S = 0.521 ()			S _R = mp	h (Exhibit 13-12	<u>(</u>)		
M _S = 0.521 (S _R = 55.4 m	ph (Exhibit 13-11)					h (Exhibit 13-12 h (Exhibit 13-12			
M _S = 0.521 (S _R = 55.4 m S ₀ = 63.0 m)			S ₀ = mp		2)		

General Information			Site Information		
Analyst Agency or Company Date Performed	AECOM		Highway/Direction of Travel From/To Jurisdiction	I-95 NB	
Analysis Time Period	PM		Analysis Year	No-Build	2020
Project Description SW 10th	h Street SIMR				
✓ Oper.(LOS)			Des.(N)	Plar	nning Data
Flow Inputs					
Volume, V AADT	6370	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	
_ane Width		ft			
Rt-Side Lat. Clearance		ft	f _{LW}		mph
Number of Lanes, N	3		f _{LC}		mph
Fotal Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			
LOS and Performance	Measures		Design (N)		
Operational (LOS)			<u>Design (N)</u>		
v _p = (V or DDHV) / (PHF x N x	x f _{uv} x f _a) 2269	pc/h/ln	Design LOS		
S	μν p [,] 56.7	mph	v _p = (V or DDHV) / (PHF x N x	f _{HV} x f _p)	pc/h/ln
$D = v_p / S$	40.0	pc/mi/ln	S		mph
LOS	E	p 0, 11, 11	$D = v_p / S$		pc/mi/ln
	_		Required Number of Lanes, N		
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v _p - Flow rate ₋ OS - Level of service	S - Speed D - Density FFS - Free-flow BFFS - Base fre	-	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-17

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		RAMP	S AND RAM	P JUNCTI	ONS WO	RKSF	IEET			
General Infoi	rmation			Site Infor	mation					
Analyst			Fre	eeway/Dir of Tr	avel	I-95 NB				
gency or Company	y AECO	OM		nction						
Date Performed				risdiction						
nalysis Time Perio			An	alysis Year		No-Build	2020			
Project Description	SW 10th Stree	I SIMR								
		Freeway Num	ber of Lanes, N	3						
Upstream Adj F		Ramp Numbe		5 1					Downstrea Ramp	m Adj
✓ Yes	✓ On	Acceleration L	ane Length, L _A						Yes	On
No	Off		ane Length L _D	220					🗹 No	Off
L _{up} = 30	085 ft	-	Freeway Volume, V _F 6370						L _{down} =	ft
Lup 30	J0J II	Ramp Volume	i v	680 70.0					down	
V _u = 11	160 veh/h		-Flow Speed, S _{FF} ow Speed, S _{FR}	70.0 45.0					V _D =	veh/h
Conversion t	to nc/h Uni			+0.0						
				0/ Trucela	0/ D	f		f		vf vf
(pc/h)	(Veh/hr)	PHF	Terrain	%Truck	%Rv		ΗV	1.	v = V/PHF	ľ
reeway	6370	0.95	Level	3	0	0.9		1.00	68	
Ramp	680	0.92	Level	2	0	0.9		1.00	74	
JpStream	1160	0.92	Level	2	0	0.9	90	1.00	12	73
DownStream		Merge Areas								
stimation o		Estimat	ion of		Diverge Areas					
	V ₁₂ = V _F				Lotimat			<u> </u>	<u>, </u>	
					= V _R + (V _F - V _F					
- _{EQ} = (Equation 13-6 or 13-7)					L _{EQ} =		74	454.65 (Equati	on 13-12 o	r 13-13)
FM =	using	Equation (E	Exhibit 13-6)		P _{FD} =		0	.555 using Equ	uation (Exhil	oit 13-7)
	pc/h				V ₁₂ =		4	113 pc/h		
$_3$ or V $_{\rm av34}$	pc/h (Equation 13	-14 or 13-17)		V ₃ or V _{av34}		2	693 pc/h (Equ	ation 13-14	or 13-17
s V_3 or $V_{av34} > 2,70$						2,70		Yes 🗹 No		
s V_3 or $V_{av34} > 1.5$								Yes No		
			-16, 13-18, or			•		c/h (Equation	13-16, 13-	18. or 13
Yes,V _{12a} =	13-19)		,,,		If Yes,V _{12a} =		1	9)	10 10, 10	10, 01 10
Capacity Che	ecks				Capacit	y Che	cks			
	Actual	C	apacity	LOS F?			Actual		pacity	LOS F
					V _F		6806	Exhibit 13-8	7200	No
V _{FO}		Exhibit 13-8			V _{FO} = V _F	- V _R	6059	Exhibit 13-8	7200	No
					V _R		747	Exhibit 13-1	0 2100	No
Flow Entering Merge Influence Area					Flow Entering Diverge Influence Area					
low Enterin				0				M. D		Violation
	g Merge In Actual	Max	Desirable	Violation?		A	ctual	Max Desirat		VIOIALIOI
				Violation?	V ₁₂	41	13	Exhibit 13-8	4400:All	No
V _{R12}	Actual	Max Exhibit 13-8	Desirable	Violation?	V ₁₂	41	13		4400:All	No
V _{R12} .evel of Serv	Actual	Max Exhibit 13-8	Desirable if not F)	Violation?	V ₁₂ Level of	4 f Serv	13 i ce De	Exhibit 13-8	4400:All n (if not l	No
V _{R12} .evel of Serv D _R = 5.475 + 0	Actual vice Detern	Max Exhibit 13-8	Desirable if not F)	Violation?	V ₁₂ Level of	4 f Serv	13 ice De 252 + 0	Exhibit 13-8 Eterminatio	4400:All n (if not l	No
V _{R12} .evel of Serv D _R = 5.475 + 0 _R = (pc/mi/lr	Actual vice Detern 0.00734 v _R + (n)	Max Exhibit 13-8	Desirable if not F)	Violation?	V_{12} Level of $D_R = 37$	4 f Serv D _R = 4. 7.6 (pc/r	13 ice De 252 + 0 ni/ln)	Exhibit 13-8 Eterminatio	4400:All n (if not l	No
V _{R12} .evel of Serv D _R = 5.475 + 0 _R = (pc/mi/lr OS = (Exhibit	Actual vice Detern 0.00734 v _R + 0 n) 13-2)	Max Exhibit 13-8	Desirable if not F)	Violation?	V ₁₂ Level of D _R = 37 LOS = E	4 [°] f Serv D _R = 4. 7.6 (pc/r (Exhibi	13 ice De 252 + 0 ni/ln) t 13-2)	Exhibit 13-8 Etermination 0.0086 V ₁₂ - 0.	4400:All n (if not l	No
V_{R12} Level of Serv $D_{R} = 5.475 + 0$ $D_{R} = (pc/mi/lr)$ $OS = (Exhibit)$ Speed Detern	Actual vice Detern 0.00734 v _R + 0 n) 13-2) mination	Max Exhibit 13-8	Desirable if not F)	Violation?	V_{12} Level of $D_R = 37$ LOS = E Speed L	4 ² f Serv D _R = 4. 7.6 (pc/r (Exhibi Detern	13 i ce De 252 + 0 ni/ln) t 13-2) ninatic	Exhibit 13-8 Etermination 0.0086 V ₁₂ - 0.	4400:All n (if not l	No
V_{R12} Evel of Serv $D_{R} = 5.475 + 0$ $P_{R} = (pc/mi/lr)$ $OS = (Exhibit)$ Speed Detern $P_{S} = (Exibit 1)$	Actual vice Detern 0.00734 v _R + (n) 13-2) mination 13-11)	Max Exhibit 13-8	Desirable if not F)	Violation?	V_{12} Level of $D_R = 37$ LOS = E Speed L $D_s = 0.$	4 ² D _R = 4. 7.6 (pc/r (Exhibi Detern 365 (Ex	13 ice De 252 + 0 ni/ln) t 13-2) ninatio hibit 13	Exhibit 13-8 etermination 0.0086 V ₁₂ - 0. 0.0086 V ₁₂ - 0.	4400:All n (if not l	No
V_{R12} $D_{R} = 5.475 + 0$ $D_{R} = (pc/mi/lr)$ $OS = (Exhibit)$ $Speed Detern$ $M_{S} = (Exibit 1)$ $R_{R} = mph (Exhibit 2)$	Actual vice Detern 0.00734 v _R + 0 13-2) mination 13-11) hibit 13-11)	Max Exhibit 13-8	Desirable if not F)	Violation?	V_{12} <i>Level of</i> $D_R = 37$ <i>LOS</i> = E <i>Speed L</i> $D_s = 0$. $S_R = 59$	4 f Serv D _R = 4. 7.6 (pc/r (Exhibit Detern 365 (Ex 9.8 mph	13 ice De 252 + 0 ni/ln) t 13-2) ninatio hibit 13 Exhibit	Exhibit 13-8 Etermination 0.0086 V ₁₂ - 0. 0.0086 V ₁₂ - 0. 0.0086 V ₁₂ - 0. 13-12)	4400:All n (if not l	No
V_{R12} evel of Serv $D_{R} = 5.475 + 0$ $P_{R} = (pc/mi/lr)$ $OS = (Exhibit)$ $CS = ($	Actual vice Detern 0.00734 v _R + 0 13-2) mination 13-11) hibit 13-11) hibit 13-11)	Max Exhibit 13-8	Desirable if not F)	Violation?	V_{12} <i>Level of</i> $D_R = 37$ LOS = E <i>Speed L</i> $D_s = 0.$ $S_R = 59$ $S_0 = 70$	4' f Serv D _R = 4. 7.6 (pc/r (Exhibi Determ 365 (Ex 9.8 mph 0.2 mph	13 ice De 252 + 0 ni/ln) t 13-2) ninatio hibit 13 Exhibit Exhibit	Exhibit 13-8 Etermination 0.0086 V ₁₂ - 0. 0.0086 V ₁₂ - 0.	4400:All n (if not l	No
V_{R12} evel of Serv $D_{R} = 5.475 + 0$ $R^{=} (pc/mi/lr)$ $DS = (Exhibit)$ $Freed Deterr$ $R^{=} (Exibit 1)$ $R^{=} mph (Exh)$ $DS = mph (Exh)$	Actual vice Detern 0.00734 v _R + 0 13-2) mination 13-11) hibit 13-11)	Max Exhibit 13-8	Desirable if not F)	Violation?	V_{12} <i>Level of</i> $D_R = 37$ LOS = E <i>Speed L</i> $D_s = 0.$ $S_R = 59$ $S_0 = 70$	4 f Serv D _R = 4. 7.6 (pc/r (Exhibit Detern 365 (Ex 9.8 mph	13 ice De 252 + 0 ni/ln) t 13-2) ninatio hibit 13 Exhibit Exhibit	Exhibit 13-8 Etermination 0.0086 V ₁₂ - 0. 0.0086 V ₁₂ - 0.	4400:All n (if not l	No

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 NB Seg 12-E No-Build	Bet Off & On Hillsbord I 2020
Project Description SW 10th	n Street SIMR		- 4.0		
Oper.(LOS)			Des.(N)	Pla	nning Data
<i>Flow Inputs</i> Volume, V AADT	5690	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) 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	Maasuras		Design (N)		
Operational (LOS) v _p = (V or DDHV) / (PHF x N) S D = v _p / S LOS		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	-	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

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			FREEWA	Y WEAV			T		
Genera	al Informati	on			Site Information				
Analyst Agency/Co Date Perfo Analysis T		AECO PM	М		Freeway/Dir of Travel I-95 NB Weaving Segment Location Seg 13-Bet On & Off Hillsb Analysis Year No-Build 2020				Off Hillsboro
Project De Inputs	escription SW 10	th Street SIM	२						
Weaving configuration On Weaving number of lanes, N Weaving segment length, L _s Freeway free-flow speed, FFS Conversions to pc/h Under Base Cond				One-Sided 4 790ft 70 mph	Segment type Freeway minimum speed, S _{MIN} Freeway maximum capacity, C _{IFL} Terrain type				Freewa 24(Lev
Conve		1		1	1	I _			<u> </u>
	V (veh/h)	PHF	Truck (%)	RV (%)	Ε _Τ	E _R	f _{HV}	fp	v (pc/h)
V _{FF}	5060	0.95	3	0	1.5	1.2	0.985	1.00	5406
V _{RF}	630	0.92	2	0	1.5	1.2	0.990	1.00	692
V _{FR}	630	0.92	2	0	1.5	1.2	0.990	1.00	692
V _{RR}	0	0.95	2	0	1.5	1.2	0.990	1.00	0
V _{NW}	5406							V =	6790
V _W	1384								
VR	0.204								
Config	uration Cha	aracteris	tics						
Minimum	maneuver lanes,	N _{WL}		2 lc	Minimum we		1384 lc		
	ge density, ID			0.7 int/mi	Weaving lane changes, LC _w				1595 lc
Minimum	RF lane changes	, LC _{RF}		1 lc/pc	Non-weaving	g lane chang	es, LC _{NW}		771 lc/
Minimum	FR lane changes	, LC _{FR}		1 lc/pc	Total lane ch	nanges, LC _{AL}	L		2366 lc/
Minimum	RR lane changes	s, LC _{RR}		lc/pc	Non-weaving vehicle index, I _{NW}				
Weavi	ng Segmen	t Speed,	Density,	Level of	Service,	and Cap	oacity		
0	segment flow rate	•		6696 veh/h	Ű,	ensity factor,			0.53
	segment capacity	ν, C _w		8315 veh/h		gment speed			51.7 mp
•	segment v/c ratio	_		0.805	Average weaving speed, S _w				50.8 mp
-	segment density, Service, LOS	U	3	2.9 pc/mi/ln	Average nor				51.9 mp
				D	Maximum w	eaving length	i, L _{MAX}		4575
Notes	segments longer t	than the calcul	ated maximum l	ength should l	be treated as is	solated merge	and diverge an	eas using the	procedures of
Chapter 13	8, "Freeway Merge mes that exceed th	and Diverge S	egments".	0		bolated merge	and diverge di		
	ersity of Florida All	0 0		ne level UI Sel		oTM Version		0	ated: 5/20/20

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Site Informationighway/Direction of Travel rom/To urisdiction nalysis YearI-95 NB Seg 14-Bet Off & On Hill Seg 14-Bet Off & On Hill On Build 2020a.(N)Planning Dataeak-Hour Factor, PHF0.95 of Trucks and Buses, PT3 of RVs, PRorrucks and Buses, PT3 of RVs, PR0 teneral Terrain: Up/Down %ER1.2 HV = 11[1+PT(ET-1) + PR(ER-1)]0.985Calc Speed Adj and FFSmph mph TRD Adjustmentmph	
rom/ToSeg 14-Bet Off & On Hill urisdiction nalysis YearSeg 14-Bet Off & On Hill No-Build 2020S.(N)Planning Dataeak-Hour Factor, PHF 0.95 of rucks and Buses, P Tabr/solution of rucks and Buses, P T 0 of seneral Terrain:Level irrade trade W 0 Length mi Up/Down %E act Speed Adj and FFSLwmph mph mphLCmph mph	
eak-Hour Factor, PHF 0.95 0 Trucks and Buses, P_T 3 0 RVs, P_R 0 0 teneral Terrain:Level 0 teneral Terrain:Level 0 teneral Variation mi 0 Up/Down % mi E_R 1.2 $HV = 1/[1+P_T(E_T-1)+P_R(E_R-1)]$ 0.985 0 Calc Speed Adj and FFS mph LW mph LC mph RD Adjustmentmph	
eak-Hour Factor, PHF 0.95 0 Trucks and Buses, P_T 3 0 RVs, P_R 0 0 teneral Terrain:Level 0 teneral Terrain:Level 0 teneral Variation mi 0 Up/Down % mi E_R 1.2 $HV = 1/[1+P_T(E_T-1)+P_R(E_R-1)]$ 0.985 0 Calc Speed Adj and FFS mph LW mph LC mph RD Adjustmentmph	
Trucks and Buses, P_T 3 P_R 0 peneral Terrain: Level prade % Length mi Up/Down % E_R 1.2 $H_V = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$ 0.985 Calc Speed Adj and FFS LW mph LC mph TRD Adjustment mph	
Trucks and Buses, P_T 3 P_R 0 peneral Terrain: Level prade % Length mi Up/Down % E_R 1.2 $H_V = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$ 0.985 Calc Speed Adj and FFS LW mph LC mph TRD Adjustment mph	
arade%Lengthmi $Up/Down %$ $I.2$ E_R $I.2$ $HV = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$ 0.985 Calc Speed Adj and FFS $I.2$ LWmphLCmphTRD Adjustmentmph	
$H_{V} = 1/[1+P_{T}(E_{T}-1) + P_{R}(E_{R}-1)] \qquad 0.985$ Calc Speed Adj and FFS $H_{UW} \qquad \qquad mph$ $H_{LC} \qquad mph$ $H_{RD} Adjustment \qquad mph$	
$H_{V} = 1/[1+P_{T}(E_{T}-1) + P_{R}(E_{R}-1)] \qquad 0.985$ Calc Speed Adj and FFS $H_{UW} \qquad \qquad mph$ $H_{LC} \qquad mph$ $H_{RD} Adjustment \qquad mph$	
Calc Speed Adj and FFS Tw mph LC mph TRD Adjustment mph	
LW mph LC mph TRD Adjustment mph	
LC mph IRD Adjustment mph	
LC mph IRD Adjustment mph	
IRD Adjustment mph	
FFS 70.0 mph	
Design (N)	
esign (N) esign LOS	
$_{p}$ = (V or DDHV) / (PHF x N x f _{HV} x f _p) pc/h/	/ln
mph	
$p = v_p / S$ pc/m required Number of Lanes, N	ni/In
actor Location	
f _R - Exhibits 11-10, 11-12 f _{LW} - Exhibit 1 T - Exhibits 11-10, 11-11, 11-13 f _{LC} - Exhibit 11 - Page 11-18 TRD - Page 1	1-9
	equired Number of Lanes, N actor Location _R - Exhibits 11-10, 11-12 f _{LW} - Exhibit 1

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			REEWA	WEAV		_			
Genera	I Informati	on			Site Information				
-	rmed me Period	AECO PM			Freeway/Dir Weaving Seg Analysis Yea	gment Locati		IB 5-Bet On & C uild 2020	Off to Exp
Project De: Inputs	scription SW 10	th Street SIM	λ						
Weaving configuration Two-Sided Weaving number of lanes, N 3 Weaving segment length, L _s 4665ff Freeway free-flow speed, FFS 70 mph Conversions to pc/h Under Base Condition					Freeway minimum speed, S _{MIN} Freeway maximum capacity, C _{IFL} Terrain type				Freewa 24(Lev
COILVEI	V (veh/h)	PHF	Truck (%)	RV (%)	E _T	E _R	f _{HV}	fp	v (pc/h)
V _{FF}	4665	0.95	3	0	1.5	1.2	0.985	1.00	4984
V _{RF}	575	0.92	2	0	1.5	1.2	0.990	1.00	631
V _{FR}	1025	0.92	2	0	1.5	1.2	0.990	1.00	1125
V _{RR}	65	0.92	2	0	1.5	1.2	0.990	1.00	71
V _{NW}	6740							V =	6811
V _W	71								
VR	0.010								
Config	uration Ch	aracteris	tics		_				
Minimum r	maneuver lanes,	N _{WL}		0 lc	Minimum weaving lane changes, LC _{MIN}				213 lc
Interchang	e density, ID			0.7 int/mi	Weaving lan	e changes, L	-C _w		568 lc
Minimum F	RF lane changes	, LC _{rf}		0 lc/pc	Non-weaving	g lane chang	es, LC _{NW}		3192 lc
Minimum F	R lane changes	, LC _{FR}		0 lc/pc	Total lane ch	3760 lc			
Minimum F	RR lane changes	, LC _{RR}		3 lc/pc	Non-weaving vehicle index, I _{NW} 22				
Weavir	ng Segmen	t Speed,	Density, I	Level of	f Service, and Capacity				
•	egment flow rate			6721 veh/h	Weaving inte				0.19 57.6 mp
	egment capacity	, c _w		6831 veh/h	Weaving segment speed, S Average weaving speed, S _w				61.2 mp
•	egment v/c ratio	п	21	0.984 9.4 pc/mi/ln					57.6 mp
-	egment density, ervice, LOS	U	3	9.4 pc/mi/in E	Average non-weaving speed, S _{NW} Maximum weaving length, L _{Max}				57.0 mj 5824
Notes	,			-		caving iongli	", -MAX		5024

Chapter 13, "Freeway Merge and Diverge Segments". b. For volumes that exceed the weaving segment capacity, the level of service is "F".

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	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	AECOM PM		Highway/Direction of Travel From/To Jurisdiction Analysis Year	I-95 NB Seg 16- No-Build	North of Hillsboro 1 2020
Project Description SW 10th	h Street SIMR				anian Data
✓ Oper.(LOS) Flow Inputs			Des.(N)		anning Data
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D	5240	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	nonte		Up/Down %		
Calculate Flow Adjustn fp	1.00		E _R	1.2	
Έ Ε _Τ	1.5		R 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) 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		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 bo	S - Speed D - Density FFS - Free-flow BFFS - Base fre	-	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11
V - Hourly volume v _p - Flow rate	D - Density FFS - Free-flow BFFS - Base fre ur volume	-	E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18		-3

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DAGIOTIN	LEWAT SE		. 1	
		Site Information		
		Highway/Direction of Trave		
AECOM		From/To	Seg 1-E Palmett	Bet Hillsboro & o
AM		Jurisdiction Analysis Year	No-Buil	d 2020
0th Street SIM	1R			
		Des.(N)	🗌 Plar	nning Data
4540	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T	0.95 3	
	-	%RVs, P _R	0	
	veh/h	General Terrain: Grade % Length	Level mi	
tments		- 1 -		
		E	12	
1.5				
		Calc Speed Adj and	FFS	
	ft			
	ft	f _{LW}		mph
3				mph
	ramps/mi			mph
70.0	mph	-	70.0	mph
	mph		10.0	mpn
e Measures	3	Design (N)		
		<u>Design (N)</u> Design I OS		
N x f _{HV} 1617	pc/h/ln	$v_p = (V \text{ or DDHV}) / (PHF x)$	N x f _{HV}	pc/h/ln
68.0	mph			
23.8	pc/mi/ln			mph
С		٢	s, N	pc/mi/ln
		Factor Location		
-		E _R - Exhibits 11-10, 11-12		f _{LW} - Exhibit 11-8
FFS - Free	e-flow speed	f _p - Page 11-18		f _{LC} - Exhibit 11-9 TRD - Page 11-1
hour volume		11-3	· · <i>L</i> ,	
	AECOM AM Oth Street SIM 4540 4540 4540 1.00 1.5 3 70.0 e Measures N × f _{HV} 1617 68.0 23.8 C S - Spee D - Dens FFS - Free BFFS - Ba	AECOM AM Oth Street SIMR 4540 veh/h veh/day 4540 veh/h veh/day 1.00 1.5 1.5 1.00 1.5 1.5 1.00 1.5 1.5 1.5 1.00 1.5 1.5 1.00 1.5 1.5 1.00 1.5	Site InformationAECOMFrom/ToAECOMFrom/ToAMAnalysis YearOth Street SIMRDes.(N)4540veh/hPeak-Hour Factor, PHF %Trucks and Buses, PT %RVs, PR General Terrain: Grade % Length Up/Down %1.00ER 1.51.00ER ft ft1.5f_HV = 1/[1+PT(ET-1) + PR(ER-1)]1.00FR fLC1.5ft fLC1.00FR fLC2.5Calc Speed Adj and fLCft ft ft fLC70.0mph mphPSDesign (N)e MeasuresDesign (N) Design LOS Vp = (V or DDHV) / (PHF x x fp) S D = vp / S Required Number of LaneeS - Speed D - DensityER - Exhibits 11-10, 11-12 FFS - Free-flow speed BFFS - Base free-flow	AECOMHighway/Direction of Travel I-95 SB Seg 1-E Palmett JurisdictionAMAnalysis YearNo-Buil M Analysis YearNo-Buil M Analysis YearNo-Buil M Des.(N)Plan 4540 veh/hPeak-Hour Factor, PHF0.95 100 ER1.21.2 1.00 ER1.21.2 1.00 FR1.21.2 1.00 Ftftft 1.00 Frftft 1.00 Frft<

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<u></u>	- f		REEWA							
Gener	al Informati	on			Site Information					
Analyst Agency/C Date Perfe Analysis T		AECO AM	М		Freeway/Dir of Travel I-95 SB Weaving Segment Location Seg 2-Bet On from Exp & 0 Analysis Year No-Build 2020				Exp & Off	
	escription SW 10	th Street SIM	2							
Inputs					1					
Weaving number of lanes, N Weaving segment length, L _s Freeway free-flow speed, FFS				One-Sided 3 5085ft 70 mph	Freeway min	Segment type Freeway minimum speed, S _{MIN} Freeway maximum capacity, C _{IFL} Terrain type			Freew 24 Lev	
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}	3440	0.95	3	0	1.5	1.2	0.985	1.00	3675	
V _{RF}	1070	0.92	2	0	1.5	1.2	0.990	1.00	1175	
V _{FR}	1100	0.92	2	0	1.5	1.2	0.990	1.00	1208	
V _{RR}	120	0.92	2	0	1.5	1.2	0.990	1.00	132	
V _{NW}	3807		V =					V =	6190	
V _W	2383									
VR	0.385									
Config	juration Cha	aracteris	tics		_					
Minimum	maneuver lanes,	N _{WL}		2 lc	Minimum we		0 lc			
Interchan	ge density, ID			0.7 int/mi	Weaving lane changes, LC _w				371 lc	
Minimum	RF lane changes	, LC _{RF}		0 lc/pc	Non-weaving	g lane chang	es, LC _{NW}		2538 lc	
Minimum	FR lane changes	, LC _{FR}		0 lc/pc	Total lane ch	nanges, LC _{AL}	L		2909 lc	
Minimum	RR lane changes	s, LC _{RR}		lc/pc	Non-weaving	g vehicle inde	ex, I _{NW}		135	
Weavi	ng Segmen	t Speed,	Density,	Level of	Service,	and Cap	oacity			
Weaving	segment flow rate	9, V		6111 veh/h	Weaving inte	ensity factor,	W		0.14	
Weaving	segment capacity	ν, C _w		6142 veh/h	Weaving see				61.2 mp	
Weaving	segment v/c ratio			0.995	Average weaving speed, S _w				63.0 mp	
-	segment density,	D	3	3.7 pc/mi/ln	Average non-weaving speed, $S_{_{\sf NW}}$				60.1 mp	
	Service, LOS			D	Maximum w	eaving length	n, L _{MAX}		6513	
Notes	a anamonta lang	hon the select	atod movimum 1	onath about -	o trooted as :-		and diverse ==		procedures -4	
Chapter 13	g segments longer t 3, "Freeway Merge	and Diverge Se	egments".	C		solated merge	and diverge are	eas using the	procedures of	
	mes that exceed th ersity of Florida, All	0 0		THE TEVEL OF SEL		0 TM Version		Conor	ated: 5/20/20	

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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 3-B No-Build	et Off & On Ramp I 2020
Project Description SW 10th	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	4510	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	
		ven/m	Up/Down %	1111	
Calculate Flow Adjustm	nents				
f _p	1.00		E _R	1.2	
E _T	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
Speed Inputs			Calc Speed Adj and FFS	6	
Lane Width Rt-Side Lat. Clearance		ft ft	f _{LW}		mph
Number of Lanes, N	3	-	f _{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			
LOS and Performance I	Veasures		Design (N)		
<u>Operational (LOS)</u> v _p = (V or DDHV) / (PHF x N x S D = v _p / S LOS	t f _{HV} x f _p) 1606 68.1 23.6 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	S - Speed D - Density FFS - Free-flow BFFS - Base free	-	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11
DDHV - Directional design hou			HCS 2010 TM Version 6.90		enerated: 5/20/2019 1

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	RA	MPS AND	RAMP JUN		ORKSHE	ET			
General Infor	rmation			Site Infor	mation				
Analyst			Fr	eeway/Dir of Tr	avel I-9	95 SB			
gency or Company	AEC	MC	Ju	nction	S	eg 4-Merge fror	n Hillsboro WB		
ate Performed				risdiction					
nalysis Time Perio			An	alysis Year	N	o-Build 2020			
roject Description	SW 10th Stree	t SIMR							
nputs		Eroowov Num	ber of Lanes, N	3					
Ipstream Adj Ramp				3				Downstre	eam Adj
🗹 Yes 🗌 Or	n	Ramp Number		1				Ramp	
	1		ane Length, L _A	950				🗌 Yes	🗌 On
No 🗹 Of	f	Deceleration L	ane Length L _D					🗹 No	Off
		Freeway Volu	me, V _F	4510					
_{up} = 2175	ft	Ramp Volume	, V _R	630				L _{down} =	ft
		Freeway Free	-Flow Speed, S _{FF}	70.0				V _D =	veh/h
' _u = 1220 ·	ven/h	Ramp Free-Fl	ow Speed, S _{FR}	50.0				* D	VEII/II
Conversion t	o pc/h Un	der Base (Conditions						
	V	PHF	Terrain	%Truck	%Rv	f	f	у = \//РН	F x f _{HV} x f _p
(pc/h)	(Veh/hr)					f _{HV}	r r		I.
reeway	4510	0.95	Level	3	0	0.985	1.00		4819
Ramp	630	0.92	Level	2	0	0.990	1.00		692
JpStream	1220	0.92	Level	2	0	0.990	1.00		1339
DownStream		Merge Areas					Diverge Areas		
stimation of		werge Areas			Estimatio		Diverge Areas		
		<u> </u>			Lounduo	12			
	V ₁₂ = V _F					V ₁₂ =	$V_{R} + (V_{F} - V_{R})$)P _{FD}	
_{EQ} =	1814.15	6 (Equation	13-6 or 13-7)		L _{EQ} =		(Equation 13-	12 or 13-	13)
FM =	0.604	using Equat	ion (Exhibit 13-6)		P _{FD} =		using Equatio		-
' ₁₂ =	2911	pc/h			V ₁₂ =		pc/h	,	,
V_3 or V_{av34}		pc/h (Equatio	on 13-14 or 13-		V_3^{12} or V_{av34}^{12}		pc/h (Equation 1	3-14 or 13-	17)
	17)						Yes No		,
s V_3 or $V_{av34} > 2,70$									
s V ₃ or V _{av34} > 1.5			10 10 10				pc/h (Equation	n 13-16. ⁻	13-18, or
Yes,V _{12a} =		pc/n (Equatio 13-19)	on 13-16, 13-		lf Yes,V _{12a} =		3-19)	,	,
Capacity Che		10 10)			Capacity	Checks			
	Actual	С	apacity	LOS F?		Actual	Car	pacity	LOS F?
					V _F		Exhibit 13-8		
N/	5544			NI-	V _{FO} = V _F -	V_	Exhibit 13-8	_	
V _{FO}	5511	Exhibit 13-8		No		- R	Exhibit 13-		
					V _R		10		
low Entering	g Merge In	fluence A	rea		Flow Ente	ering Dive	rge Influen	ce Area	3
	Actual	1	Desirable	Violation?		Actual	Max Desi	rable	Violation?
V _{R12}	3603	Exhibit 13-8	4600:All	No	V ₁₂		Exhibit 13-8		
evel of Serv.	vice Detern	nination (i	if not F)	B	Level of S	Service De	eterminatio	n (if no	tF)
D _R = 5.475 +	• 0.00734 v _R + ().0078 V ₁₂ - 0.0	0627 L _A		D	_R = 4.252 + 0).0086 V ₁₂ - 0.	009 L _D	
_R = 27.3 (pc/n						/mi/ln)		2	
OS = C (Exhibit	-					hibit 13-2)			
Speed Deterr	,					eterminati	<u>0</u> n		
-							011		
1 _S = 0.369 (Exi					, i	nibit 13-12) N(Exhibit 12-12))		
	(Exhibit 13-11)					n (Exhibit 13-12)			
•	(Exhibit 13-11)				v i	n (Exhibit 13-12)			
= 61.4 mph	(Exhibit 13-13)				S= mph	n (Exhibit 13-13))		
t © 2016 University	of Elorida All Dia	hte Deconvod			HCS2010 [™]	V/		Conorat	ed: 5/21/2019

General Information			Site Information		
Analyst			Highway/Direction of Travel	195/SB	
Agency or Company	AECOM		From/To	Seg 5-Be	et WB On & EB On
Date Performed			Jurisdiction	Ramps	
Analysis Time Period	AM		Analysis Year	No-Build	2020
Project Description SW 10th	n Street SIMR				
Oper.(LOS)			Des.(N)	Plar	nning Data
Flow Inputs					
Volume, V AADT	5140	veh/h	Peak-Hour Factor, PHF	0.95 2	
		veh/day	%Trucks and Buses, P _T	3	
Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D			%RVs, P _R General Terrain:	0 Level	
$DDHV = AADT \times K \times D$		veh/h	Grade % Length	mi	
			Up/Down %		
Calculate Flow Adjustn	nents				
f _p	1.00		E _R	1.2	
Ē _T	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
Speed Inputs			Calc Speed Adj and FFS	5	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f _{LW}		mph
Number of Lanes, N	3		f _{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			·
LOS and Performance	Measures		Design (N)		
			Design (N)		
Operational (LOS)			Design LOS		
v _p = (V or DDHV) / (PHF x N >	I.	pc/h/ln	$v_p = (V \text{ or DDHV}) / (PHF x N x)$	f _{HV} x f _n)	pc/h/ln
S	65.4	mph	S	ni p	mph
$D = v_p / S$	28.0	pc/mi/ln	D = v _p / S		pc/mi/ln
LOS	D		Required Number of Lanes, N		
Glossary			Factor Location		
N - Number of lanes	S - Speed				
V - Hourly volume	D - Density		E _R - Exhibits 11-10, 11-12	10	f _{LW} - Exhibit 11-8
v _p - Flow rate	FFS - Free-flow	speed	E _T - Exhibits 11-10, 11-11, 11-	-13	f _{LC} - Exhibit 11-9
LOS - Level of service	BFFS - Base fre	-	f _p - Page 11-18		TRD - Page 11-1
DDHV - Directional design ho			LOS, S, FFS, v _p - Exhibits 11-	2, 11-3	
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Gener	al Information	on			Site Info	ormation			
Analyst Agency/C Date Perf Analysis		AECOM AM		Freeway/Dir of Travel I-95 SB Weaving Segment Location Seg 6- Bet H Analysis Year No-Build 202					ro & 10th St
Project D Inputs	escription SW 10t	h Street SIMR							
Weaving Weaving Weaving	configuration number of lanes, N segment length, L free-flow speed, Fl	3		One-Sided 4 1830ft 70 mph		nimum speed Iximum capao			Free 2
Conve	ersions to po	c/h Under	Base Co	ondition	S		_		_
	V (veh/h)	PHF	Truck (%)	RV (%)	Ε _Τ	E _R	f _{HV}	fp	v (pc/h
V _{FF}	3960	0.95	3	0	1.5	1.2	0.985	1.00	4231
V _{RF}	740	0.92	2	0	1.5	1.2	0.990	1.00	812
V _{FR}	1180	0.92	2	0	1.5	1.2	0.990	1.00	1295
V _{RR}	0	0.95	0	0	1.5	1.2	1.000	1.00	0
V _{NW}	4231			-		-		V =	6338
V _w	2107							•	
VR	0.332								
Config	guration Cha	aracterist	ics		_				
Minimum	maneuver lanes, l	N _{WL}		2 lc	Minimum we	eaving lane c	hanges, LC _M	N	812
Interchan	nge density, ID			0.7 int/mi	Weaving lar	ne changes, l	_C _w		1185
Minimum	RF lane changes,	LC_{RF}		1 lc/pc	Non-weavin	g lane chang	es, LC _{NW}		1093
Minimum	FR lane changes,	$\rm LC_{FR}$		0 lc/pc	Total lane c	hanges, LC _{AL}	L		2278
Minimum	RR lane changes	, LC _{RR}		lc/pc	Non-weavin	g vehicle ind	ex, I _{NW}		
Weavi	ng Segment	t Speed, I	Density,	Level of	Service,	and Ca	oacity		
Weaving	segment flow rate	, V		6256 veh/h		ensity factor,			0.
Weaving	segment capacity,	Cw		7113 veh/h	, v	gment speed			57.1 r
v	segment v/c ratio			0.879	•	aving speed,	**		58.4 r
-	segment density, I	D	2	7.7 pc/mi/ln	-	n-weaving sp			56.5 r
	Service, LOS			С	Maximum w	eaving lengtl	n, L _{MAX}		593
Notes			ad may!	anath at such	a traat-d - '		and diverse		
Chapter 1	g segments longer ti 3, "Freeway Merge a	and Diverge Seg	gments".	-		solated merge	and diverge a	reas using the	procedures
	umes that exceed the ersity of Florida, All	0 0		ne level of sei		0 TM Version			

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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 7-B No-Build	et Off & On Ramp I 2020
Project Description SW 10th	Street SIMR				
✓ Oper.(LOS)			Des.(N)	Pla	inning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D	4700	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain:	0.95 3 0 Level	
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	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		ft			
Rt-Side Lat. Clearance		ft	f _{LW}		mph
Number of Lanes, N	3		f _{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			
LOS and Performance I	Measures		Design (N)		
<u>Operational (LOS)</u> v _p = (V or DDHV) / (PHF x N x S D = v _p / S LOS	c f _{HV} x f _p) 1674 67.4 24.8 C	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	S - Speed D - Density FFS - Free-flow BFFS - Base fro	-	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11
DDHV - Directional design ho Copyright © 2016 University of Florida.			HCS 2010 TM Version 6.90		enerated: 5/21/2019 1

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	RA	MPS AND	RAMP JUN	CTIONS W	ORKSHE	ET			
General Info	rmation			Site Infor	mation				
Analyst			Fr	eeway/Dir of Tr	avel I-9	95 SB			
Agency or Company	AEC	ОМ		nction		eg 8-Merge fror	n 10th St		
Date Performed			Ju	risdiction		• •			
Analysis Time Perio				alysis Year	No	o-Build 2020			
Project Description	I-95 AT HILLS	BORO BOULE	VARD IMR						
nputs		i						í	
Jpstream Adj Ramp	1	Freeway Num	ber of Lanes, N	3				Downstre	am Adi
. , .		Ramp Number	r of Lanes, N	1				Ramp	j
🗹 Yes 🛛 🗌 Oi	n	Acceleration L	ane Length, L₄	1470				□ Yes	On
			ane Length L _D						
No 🗹 Of	ff		- D	4700				🗹 No	Off
- 0010	<i>c</i> 1	Freeway Volu		4700				L _{down} =	ft
_{up} = 2210	п	Ramp Volume	IX .	1220				-down	i.
/ _u = 1180	veh/h	Freeway Free	-Flow Speed, S _{FF}	70.0				V _D =	veh/h
u 1100	VCII/II	Ramp Free-Flo	ow Speed, S _{FR}	50.0				D	
Conversion t	o pc/h Un	der Base (Conditions						
(pc/h)	V	PHF	Terrain	%Truck	%Rv	f	f	v = V/PH	F x f _{HV} x f _p
(pc/ll)	(Veh/hr)		Terrain	/011UCK	70TV	f _{HV}		v – v/i i i	' ^ ' HV ^ ' p
Freeway	4700	0.95	Level	3	0	0.985	1.00		5022
Ramp	1220	0.92	Level	2	0	0.990	1.00		1339
UpStream	1180	0.92	Level	2	0	0.990	1.00		1295
DownStream									
		Merge Areas					Diverge Areas		
stimation o	f v ₁₂				Estimatio	on of v ₁₂			
	V ₁₂ = V _F	(P _{EM})				V -			
EQ =			13-6 or 13-7)		l.	•=	V _R + (V _F - V _R		
			-		L _{EQ} =		(Equation 13-		-
P = FM =		•	ion (Exhibit 13-6)		P _{FD} =		using Equatio	n (Exhibit 1	3-7)
/ ₁₂ =	3101		10.11.10		V ₁₂ =		pc/h		
V_3 or V_{av34}	1921 17)	pc/h (Equatio	on 13-14 or 13-		V ₃ or V _{av34}		pc/h (Equation 1	3-14 or 13-	17)
ls V ₃ or V _{av34} > 2,70	,					> 2,700 pc/h? [Yes No		
							Yes No		
Is V ₃ or V _{av34} > 1.5			10.10.10			12'- 1	pc/h (Equation	n 13-16, 1	13-18. or
f Yes,V _{12a} =		pc/h (Equatio 13-19)	on 13-16, 13-		If Yes,V _{12a} =		3-19)		10 10, 01
Capacity Che		10-19)			Capacity	Chacks			
Supacity One	Actual		apacity	LOS F?		Actual	Car	pacity	LOS F?
	Actual	ŤŤ	apaony	LOOT	V _F	Actual	Exhibit 13-8	1	20011
					· · · · · · · · · · · · · · · · · · ·			_	
V _{FO}	6361	Exhibit 13-8		No	V _{FO} = V _F - '	V _R	Exhibit 13-8		
					V _R		Exhibit 13-	•	
- 	<u> </u> 	<u> </u>					10		
low Enterin	g Merge In Actual	ý.		Violation	riow Ente		rge Influen Max Desi		
\/		i n		Violation?	1/	Actual		Ianie	Violation?
V _{R12}	4440	Exhibit 13-8	4600:All	No	V ₁₂		Exhibit 13-8		
evel of Serv			1				terminatio		t F)
D _R = 5.475 +	• 0.00734 v _R + 0	0.0078 V ₁₂ - 0.0	0627 L _A		D _F	_R = 4.252 + 0	.0086 V ₁₂ - 0.	009 L _D	
0 _R = 30.3 (pc/n	ni/ln)				D _R = (pc/	/mi/ln)			
OS = D (Exhibit	13-2)					hibit 13-2)			
Speed Deteri	,					eterminatio	n n		
-							/11		
1 _S = 0.505 (Ex	,				, , , , , , , , , , , , , , , , , , ,	nibit 13-12)			
S _R = 55.9 mph	(Exhibit 13-11)					(Exhibit 13-12)			
64.9 mph	(Exhibit 13-11)				S ₀ = mph	(Exhibit 13-12)			
	(Exhibit 13-13)				S = mph	(Exhibit 13-13)			
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AECOM AM Street SIMR		Site Information Highway/Direction of Travel	I-95 SB	
AM			1-05 SB	
Street SIMR		From/To Jurisdiction Analysis Year		et 10th & Exit to Exp 2020
				nning Data
		Des.(N)		nning Data
5920	veh/h veh/day veh/h	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade % Length Up/Down %	0.95 3 0 Level mi	
nents				
1.00 1.5		E _R f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	1.2 0.985	
		Calc Speed Adj and FFS	;	
3 70.0	ft ft ramps/mi mph mph	f _{⊥w} f _{LC} TRD Adjustment FFS	70.0	mph mph mph mph
Measures		Design (N)		
f _{HV} x f _p) 2108 60.4 34.9 D	pc/h/ln mph pc/mi/ln	<u>Design (N)</u> Design LOS	f _{HV} x f _p)	pc/h/ln mph pc/mi/ln
		Factor Location		
BFFS - Base fre	-	f _p - Page 11-18		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11
	5920 5920 1.00 1.5 3 70.0 Measures f _{HV} × f _p) 2108 60.4 34.9 D S - Speed D - Density FFS - Free-flow	5920 veh/h 5920 veh/h veh/h veh/h nents 1.00 1.5 ft ft ft 70.0 mph Measures ramps/mi fHv × f _p) 2108 pc/h/ln 60.4 mph 34.9 pc/mi/ln D S S Speed D - Density FFS - Free-flow speed BFFS - Base free-flow speed BFFS - Base free-flow speed ar volume	$\begin{tabular}{ c c c c c } \hline \Box \mbox{ Des.(N)} & \Box \mbox{ Des.(N)} & \Box \mbox{ Peak-Hour Factor, PHF } & \mbox{ % Trucks and Buses, P_T } & \mbox{ % RVs, P_R } & \mbox{ General Terrain: } & \mbox{ Grade } \% & \mbox{ Length } & \mbox{ Up/Down } \% & \end{tabular} & \en$	$\begin{tabular}{ c c c c c } \hline $Des.(N) & Pla \\ \hline $Des.(N) & Pla \\ \hline $$

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		RAMP	S AND RAM			ORKS	HEET			
General Info	ormation			Site Infor						
Analyst				eeway/Dir of Tr	avel	I-95 SE				
Agency or Compar	ny AEC	OM		inction		Seg 10	- Diverge t	o Express		
Date Performed Analysis Time Peri	iod AM			risdiction alysis Year		No-Bui	4 2020			
	n SW 10th Stree		AI	Idiysis Tedi		INO-DUI	u 2020			
nputs										
•		Freeway Num	ber of Lanes, N	3						A 11
Upstream Adj	Ramp	Ramp Number		1					Downstrea Ramp	m Adj
✓ Yes	On			I						
			ane Length, L _A						🗌 Yes	On
No	Off		ane Length L _D	300					✓ No	Off
		Freeway Volu	me, V _F	5920						
L _{up} =	6000 ft	Ramp Volume	e, V _R	860					L _{down} =	ft
V -	4000 1 //	Freeway Free	-Flow Speed, S _{FF}	70.0					V _D =	veh/h
V _u =	1220 veh/h	Ramp Free-Fl	ow Speed, S _{FR}	45.0					*D	VCII/II
Conversion	to pc/h Un									
(pc/h)	V	PHF	Terrain	%Truck	%Rv		f	f	v = V/PHF	vf vf
(pc/n)	(Veh/hr)		Terrain	/0 ITUCK	/017.V		f _{HV}	f _p	v – v/i i ii	^ 'HV ^ 'p
reeway	5920	0.95	Level	3	0	0.	985	1.00	632	
Ramp	860	0.92	Level	2	0	0.	990	1.00	94	4
JpStream	1220	0.92	Level	2	0	0.	990	1.00	133	39
DownStream										
		Merge Areas			E atimat	lion o		iverge Areas		
stimation of	or v ₁₂				Estimat		^{T V} 12			
	V ₁₂ = V _F	(P _{FM})					V ₁₂ =	V _R + (V _F - V _F	P _{FD}	
_{EQ} =	(Equa	ation 13-6 or	13-7)		L _{EQ} =		92	251.65 (Equation	on 13-12 oi	r 13-13)
P _{FM} =	using	Equation (E	Exhibit 13-6)		P _{FD} =		0.	558 using Equ	ation (Exhib	oit 13-7)
/ ₁₂ =	pc/h				V ₁₂ =			949 pc/h		
V_3 or V_{av34}	pc/h (Equation 13	-14 or 13-17)		V_3 or V_{av34}		23	376 pc/h (Equa	ation 13-14	or 13-17
	,700 pc/h? 🔲 Ye		,			~~ > 2.7		Yes ⊻ No		
	.5 * V ₁₂ /2					•		Yes Vo		
0 U.0.			-16, 13-18, or				. –	c/h (Equation	13-16, 13-	18. or 13
Yes,V _{12a} =	13-19)	· ·	,,,		If Yes,V _{12a} =	=	- 1		,	
Capacity Ch	iecks				Capacit	ty Ch	ecks			
	Actual	C	apacity	LOS F?			Actual	Ca	pacity	LOS F
					V _F		6325	Exhibit 13-8	7200	No
		Exhibit 13-8			$V_{FO} = V_{F}$	- V _R	5381	Exhibit 13-8	7200	No
V _{FO}					1 · F() · F	· ` `			-	- N
V_{FO}							944	Exhibit 13-1	2100	I NO
	ng Merge In		roa		V _R		944 a Dive	Exhibit 13-10		No
	ng Merge In			Violation?	V _R	nterin	g Dive	rge Influen	ce Area	
Flow Enterii	ng Merge In Actual	Max	r ea Desirable	Violation?	V _R Flow Er	nterin	g Dive Actual	r ge Influen Max Desirab	ce Area le	Violation
Flow Enterin V _{R12}	Actual	Max Exhibit 13-8	Desirable	Violation?	V _R Flow Er	nterin	g Dive Actual 3949	r ge Influen Max Desirab Exhibit 13-8	ce Area le 4400:All	Violation No
Flow Enterin V _{R12} .evel of Ser	Actual	Max Exhibit 13-8	Desirable if not F)	Violation?	V _R Flow Er V ₁₂ Level o	nterin / f Serv	g Dive Actual 3949 /ice De	rge Influen Max Desirab Exhibit 13-8 termination	ce Area le 4400:All n (if not F	Violation No
Flow Enterin V _{R12} Level of Ser D _R = 5.475 +	Actual rvice Detern 0.00734 v _R +	Max Exhibit 13-8	Desirable if not F)	Violation?	V _R Flow Er V ₁₂ Level of	nterin 7 5 5 D _R = 4	g Dive Actual 1949 /ice De 1.252 + 0	r ge Influen Max Desirab Exhibit 13-8	ce Area le 4400:All n (if not F	Violation No
Flow Enterin V _{R12} evel of Ser D _R = 5.475 + 1 V _R = (pc/mi/	Actual r vice Detern 0.00734 v _R + /ln)	Max Exhibit 13-8	Desirable if not F)	Violation?	V_{R} Flow Er V_{12} Level of $D_{R} = 3$	nterin 7 f Serv D _R = 4 7.2 (pc.	g Dive Actual 3949 /ice De 4.252 + 0 /mi/ln)	rge Influen Max Desirab Exhibit 13-8 termination	ce Area le 4400:All n (if not F	Violation No
Flow Enterin V_{R12} evel of Ser $D_R = 5.475 + 10^{-10}$ $M_R = (pc/mi/)$ OS = (Exhibi	Actual rvice Detern 0.00734 v _R + /ln) it 13-2)	Max Exhibit 13-8	Desirable if not F)	Violation?	V_{R} Flow Er V_{12} Level or $D_{R} = 3$ LOS = E	nterin f Serv D _R = 4 7.2 (pc.	g Dive Actual 3949 /ice De 4.252 + 0 /mi/ln) pit 13-2)	r ge Influen Max Desirab Exhibit 13-8 termination .0086 V ₁₂ - 0.0	ce Area le 4400:All n (if not F	Violation No
Flow Enterin V_{R12} Evel of Ser $D_R = 5.475 + 10^{-10}$ $D_R = (pc/mi/)$ OS = (Exhibi	Actual rvice Detern 0.00734 v _R + /ln) it 13-2)	Max Exhibit 13-8	Desirable if not F)	Violation?	V_{R} Flow Er V_{12} Level of $D_{R} = 3$	nterin f Serv D _R = 4 7.2 (pc.	g Dive Actual 3949 /ice De 4.252 + 0 /mi/ln) pit 13-2)	r ge Influen Max Desirab Exhibit 13-8 termination .0086 V ₁₂ - 0.0	ce Area le 4400:All n (if not F	Violation No
Flow Enterin V_{R12} Level of Ser $D_R = 5.475 + 0$ $P_R = (pc/mi/)$ OS = (Exhibition Speed Determinication of the second seco	Actual rvice Detern 0.00734 v _R + /ln) it 13-2)	Max Exhibit 13-8	Desirable if not F)	Violation?	V_R Flow Er V_{12} Level of $D_R = 3$ LOS = ESpeed I	nterin f Serv D _R = 4 7.2 (pc. (Exhit	g Dive Actual 3949 /ice De 4.252 + 0 /mi/ln) pit 13-2)	rge Influen Max Desirab Exhibit 13-8 termination .0086 V ₁₂ - 0.0	ce Area le 4400:All n (if not F	Violation No
Flow Enterin V_{R12} evel of Ser $D_R = 5.475 + 0$ $P_R = (pc/mi/)$ OS = (Exhibit) Speed Detent	Actual rvice Detern 0.00734 v _R + /In) it 13-2) rmination 13-11)	Max Exhibit 13-8	Desirable if not F)	Violation?	V_{R} Flow Er V_{12} Level or $D_{R} = 3$ LOS = E Speed L $D_{s} = 0$	nterin f Serv D _R = 4 7.2 (pc, (Exhit Deter .383 (E	g Dive Actual 3949 /ice De 4.252 + 0 /mi/ln) Dit 13-2) minatic	rge Influent Max Desirab Exhibit 13-8 termination .0086 V ₁₂ - 0.0	ce Area le 4400:All n (if not F	Violation No
Flow Enterin V_{R12} Evel of Ser $D_R = 5.475 + 0$ $D_R = (pc/mi/)$ OS = (Exhibit Speed Detent $R^{=}$ (Exibit $R^{=}$ mph (E)	Actual rvice Detern 0.00734 v _R + /ln) it 13-2) rmination 13-11) xhibit 13-11)	Max Exhibit 13-8	Desirable if not F)	Violation?	V_R Flow Er V_{12} Level of $D_R = 3$ LOS = E Speed I $D_s = 0$ $S_R = 5$	Image: constraint of the second state of th	g Dive Actual 3949 vice De 2252 + 0 (mi/ln) bit 13-2) minatic xhibit 13-	rge Influen Max Desirab Exhibit 13-8 termination .0086 V ₁₂ - 0.0 000000000000000000000000000000000	ce Area le 4400:All n (if not F	Violation No
Flow Enterin V_{R12} Evel of Ser $D_R = 5.475 + 10^{-10}$ $D_R = (pc/mi/)$ OS = (Exhibit) Speed Deten $D_S = (Exibit)$ $R_R = mph (Exibit)$ $0^{-1} mph (Exibit)$	Actual rvice Detern 0.00734 v _R + /In) it 13-2) rmination 13-11)	Max Exhibit 13-8	Desirable if not F)	Violation?	V_R Flow Er V_{12} Level or $D_R = 3$ LOS = E Speed I $D_s = 0$ $S_R = 5$ $S_0 = 7$	Iterin Image: Arrow of the second	g Dive Actual 3949 4.252 + 0 4.252 + 0 4.252 + 0 7 mi/ln) bit 13-2) minatic xhibit 13- (Exhibit	rge Influen Max Desirab Exhibit 13-8 termination .0086 V ₁₂ - 0.0 000 12) 13-12) 13-12)	ce Area le 4400:All n (if not F	Violation No

	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 11-I No-Build	Bet Off Exp Off Sample I 2020
Project Description SW 10th	Street SIMR				
Oper.(LOS)			Des.(N)	Pla	anning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K	5060	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R	0.95 3 0	
Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	General Terrain: Grade % Length Up/Down %	Level mi	
Calculate Flow 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		ft	f _{LW}		mph
Number of Lanes, N	3		f _{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			
LOS and Performance I	Measures		Design (N)		
<u>Operational (LOS)</u> v _p = (V or DDHV) / (PHF x N x S D = v _p / S LOS	f _{HV} x f _p) 1802 65.8 27.4 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 hou	S - Speed D - Density FFS - Free-flow BFFS - Base free	-	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11
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· · · ·		RAMP	S AND RAM)RKS	HEET			
General Info	rmation			Site Infor	mation					
nalyst				eeway/Dir of Tr	avel	I-95 SB				
gency or Company	y AEC	OM		nction		Seg 12	- Diverge t	o Sample Rd		
ate Performed				risdiction						
nalysis Time Perio			Ar	alysis Year		No-Buil	d 2020			
roject Description nputs	300 1001 3096									
		Freeway Num	ber of Lanes, N	3						
Upstream Adj F	Ramp			J					Downstrea	am Adj
✓ Yes	On	Ramp Numbe		1					Ramp	
			ane Length, L _A						🗌 Yes	On
No	✓ Off		ane Length L _D	250					🗹 No	Off
		Freeway Volu	me, V _F	5060						
$L_{up} = 20$	000 ft	Ramp Volume	e, V _R	880					L _{down} =	ft
		Freeway Free	-Flow Speed, S _{FF}	70.0					V =	veh/h
V _u = 86	60 veh/h	Ramp Free-Fl	ow Speed, S _{FR}	45.0					V _D =	ven/n
Conversion t	to pc/h Un									
	V V	T T		0/ Trucela	0/ D		£	£		vf vf
(pc/h)	(Veh/hr)	PHF	Terrain	%Truck	%Rv		f _{HV}	f _p	v = V/PHF	x I _{HV} x I _p
reeway	5060	0.95	Level	3	0	0.	985	1.00	54	-06
Ramp	880	0.92	Level	2	0	0.	990	1.00	9	66
JpStream	860	0.92	Level	2	0	0.	990	1.00	9	44
DownStream										
		Merge Areas						Diverge Areas		
stimation o	of v ₁₂				Estimat	tion o	t v ₁₂			
	V ₁₂ = V _F	(P _{FM})					V ₁₂ =	: V _R + (V _F - V _F	P _{FD}	
_{EQ} =	(Equa	ation 13-6 or	13-7)		L _{EQ} =		(Equation 13-1	2 or 13-13)
FM =		Equation (E			P _{FD} =			580 using Equ		-
/ ₁₂ =	pc/h		,		V ₁₂ =			543 pc/h	(,
V_3 or V_{av34}	•	Equation 13	-14 or 13-17)		V_3^{12} or V_{av34}^{12}			363 pc/h (Equa	ation 13-1	1 or 13_17
3 av/34					3 av34					+ 01 13-17
			,			> 2 7				
s V ₃ or V _{av34} > 2,70	00 pc/h? 🗌 Ye	s 🗌 No			Is V_3 or V_{av}					
s V ₃ or V _{av34} > 2,70 s V ₃ or V _{av34} > 1.5	00 pc/h?	s 🗌 No s 🗌 No			Is $V_3^{}$ or $V_{av}^{}$ Is $V_3^{}$ or $V_{av}^{}$	_{/34} > 1.5	* V ₁₂ /2	Yes 🗹 No		
s V ₃ or V _{av34} > 2,70 s V ₃ or V _{av34} > 1.5	00 pc/h?	s	-16, 13-18, or		Is V_3 or V_{av}	_{/34} > 1.5	* V ₁₂ /2 [
s V ₃ or V _{av34} > 2,70 s V ₃ or V _{av34} > 1.5 Yes,V _{12a} =	00 pc/h?	s			Is $V_3^{}$ or $V_{av}^{}$ Is $V_3^{}$ or $V_{av}^{}$, ₃₄ > 1.5 =	* V ₁₂ /2 [p 1	Yes ☑ No c/h (Equation		
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s V ₃ or V _{av34} > 2,70 s V ₃ or V _{av34} > 1.5 Yes,V _{12a} = Capacity Che	00 pc/h? □ Ye *V ₁₂ /2 □ Ye pc/h (13-19) ecks	s 🗌 No s 🗋 No Equation 13-	-16, 13-18, or	LOS F?	Is V_3 or V_{av} Is V_3 or V_{av} If Yes, V_{12a} = Capacit	_{/34} > 1.5 = t y Ch	* V ₁₂ /2 [p 11 ecks Actual 5406	Yes No bc/h (Equation 9) Ca Exhibit 13-8	13-16, 13 pacity 7200	-18, or 13 LOS F No
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s V ₃ or V _{av34} > 2,70 s V ₃ or V _{av34} > 1.5 Yes,V _{12a} = Capacity Che V _{FO} Flow Enterin V _{R12} Evel of Serv D _R = (pc/mi/lr OS = (Exhibit	00 pc/h? ☐ Ye * V ₁₂ /2 ☐ Ye pc/h (13-19) ecks Actual g Merge In Actual /ice Detern 0.00734 v _R + n) 13-2)	s 🗌 No s 🗌 No Equation 13 Exhibit 13-8 fluence A Max Exhibit 13-8 nination (i	-16, 13-18, or apacity <i>rea</i> Desirable		Is V_3 or V_{av} Is V_3 or V_{av} If Yes, V_{12a} = Capacit V_F $V_FO = V_F$ V_R Flow Er V_{12} Level o $D_R = 3$	$_{34} > 1.5$ = ty Cho = - V _R = V _R =	* V ₁₂ /2 [p 11 2 2 2 2 2 2 2 2 2 2 2 2 2	Yes No pc/h (Equation 9) Ca Exhibit 13-8 Exhibit 13-8 Exhibit 13-10 rge Influen Max Desirab Exhibit 13-8 termination .0086 V ₁₂ - 0.0	13-16, 13	-18, or 13 LOS F No No Violation No
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AECOM AM Street SIMR		Site Information Highway/Direction of Travel From/To Jurisdiction Analysis Year	I-95 SB Seg 13-E No-Build	Bet Off & On Ramps
AM		From/To Jurisdiction	Seg 13-E	Bet Off & On Ramps
Street SIMR				2020
		Des.(N)	Pla	nning Data
4180	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %PVs_P	0.95 3	
	veh/h	General Terrain: Grade % Length Up/Down %	U Level mi	
ents				
1.00		E _R	1.2	
1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
		Calc Speed Adj and FFS	\$	
3 70.0	ft ft ramps/mi mph	f _{∟w} f _{LC} TRD Adjustment FFS	70.0	mph mph mph mph
	mpn			
easures		Design (N)		
f _{HV} x f _p) 1489 69.0 21.6 C	pc/h/ln mph pc/mi/ln	Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF x N x)$ S D = v_p / S Required Number of Lanes, N	f _{HV} x f _p)	pc/h/ln mph pc/mi/ln
		Factor Location		
BFFS - Base fre	-	f _p - Page 11-18		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11
	ents 1.00 1.5 3 70.0 easures $H_V \times f_p$) 1489 69.0 21.6 C S - Speed D - Density FFS - Free-flow BFFS - Base free- volume	veh/day veh/h veh/h ents 1.00 1.5 ft ft 3 70.0 ft ft ft 3 70.0 mph mph easures F _{HV} x f _p) 1489 pc/h/ln 69.0 mph 21.6 pc/mi/ln C S - Speed D - Density FFS - Free-flow speed BFFS - Base free-flow speed BFFS - Base free-flow speed S - Speed	veh/day $\%$ Trucks and Buses, P Turcks and Buses, P RVs, P General Terrain: Grade $\%$ Length Up/Down %ents1.00E R ft ft1.5f ft1.5ft ft ft ft3ramps/mi mph70.0mph mphDesign (N)Design (N)Design (N)Design (N)Design LOS v p = (V or DDHV) / (PHF x N x S D = v P / S Required Number of Lanes, NS- Speed D - DensityFFS - Free-flow speed BFFS - Base free-flow speedE R - Exhibits 11-10, 11-11, 11-17 p - Page 11-18 LOS, S, FFS, v, - Exhibits 11-20	veh/day $\ensure1.1.2.2.2.2.2.2.2.2.$

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Gener	al Informati	on			Site Info	rmation			
Analyst Agency/C Date Perfe Analysis T		AECO AM	М		Freeway/Dir Weaving Seg Analysis Yea	gment Locati		B 4- Bet Sampl ıild 2020	e & Copans
	escription SW 10	th Street SIM	2						
Inputs					1				
Weaving i Weaving s	configuration number of lanes, l segment length, L ree-flow speed, F	S		One-Sided 4 1650ft 70 mph	Segment typ Freeway min Freeway ma: Terrain type		Freew 24 Lev		
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}	3575	0.95	3	0	1.5	1.2	0.985	1.00	3820
V _{RF}	1790	0.92	2	0	1.5	1.2	0.990	1.00	1965
V _{FR}	605	0.92	2	0	1.5	1.2	0.990	1.00	664
V _{RR}	0	0.95	0	0	1.5	1.2	1.000	1.00	0
V _{NW}	3820		•					V =	6449
V _W	2629								
VR	0.408								
Config	juration Cha	aracteris	tics						
Minimum	maneuver lanes,	N _{WL}		2 lc	Minimum we	eaving lane c	hanges, LC _{MIN}		lc
Interchan	ge density, ID			0.7 int/mi	Weaving lan	e changes, L	.C _w		lc
Minimum	RF lane changes	, LC _{RF}		1 lc/pc	Non-weaving	g lane chang	es, LC _{NW}		lc
Minimum	FR lane changes	, LC _{FR}		1 lc/pc	Total lane ch	nanges, LC _{AL}	L		lc
Minimum	RR lane changes	s, LC _{RR}		lc/pc	Non-weaving	g vehicle inde	ex, I _{NW}		55
Weavi	ng Segmen	t Speed,	Density,	Level of	Service,	and Cap	oacity		
Weaving	segment flow rate	9, V		6367 veh/h	Weaving inte	ensity factor,	W		
Weaving	segment capacity	ν, c _w		5800 veh/h	Weaving see				mp
Weaving	segment v/c ratio			1.098	Average wea				mp
•	segment density,	D		pc/mi/ln	Average nor				mp
	Service, LOS			F	Maximum w	eaving length	n, L _{MAX}		6767
Notes	a a a monte la se	hon the select	atod movimum 1	onath chard	o trooted as :-		and diverse ==		procedures -f
Chapter 13	g segments longer t 3, "Freeway Merge	and Diverge Se	egments".	C		solated merge	and diverge are	eas using the	procedures of
	mes that exceed th ersity of Florida, All	0 0		THE TEVEL OF SE		0 TM Version		Conor	ated: 5/21/20

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General Information			Site Information		
Analyst			Highway/Direction of Trave		
Agency or Company	AECOM		From/To	Seg 1-E Palmett	Bet Hillsboro & o
Date Performed Analysis Time Period	PM		Jurisdiction Analysis Year	No-Buile	d 2020
Project Description SW 1	0th Street SIM	1R			
✓ Oper.(LOS)			Des.(N)	Plar	nning Data
Flow Inputs					
Volume, V AADT	4990	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T	0.95 3	
Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	%RVs, P _R General Terrain: Grade % Length Up/Down %	0 Level mi	
Calculate Flow Adjus	tments				
f _p	1.00		E _R	1.2	
E _T	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	1)] <i>0.985</i>	
Speed Inputs			Calc Speed Adj and	FFS	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f _{LW}		mph
Number of Lanes, N	3		f _{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			
LOS and Performanc	e Measures	3	Design (N)		
<u>Operational (LOS)</u> v _p = (V or DDHV) / (PHF x I	N X funz		<u>Design (N)</u> Design LOS		
x f _p)		pc/h/ln	v _p = (V or DDHV) / (PHF x x f _p)	N x f _{HV}	pc/h/ln
S D-v/S	66.1 26.0	mph na/mi/ln	s		mph
D = v _p / S LOS	26.9 D	pc/mi/ln	$D = v_p / S$		pc/mi/ln
	U		Required Number of Lane	s, N	
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service speed DDHV - Directional design	BFFS - Ba		E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11 f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-3	, 11-13	f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-1

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_		-	REEWA	WEAV						
Genera	al Informati	on			Site Info	rmation				
-	ime Period	AECO PM			Freeway/Dir of TravelI-95 SBWeaving Segment LocationSeg 2-Bet On from Exp & OffAnalysis YearNo-Build 2020					
Project De Inputs	scription I-95 AT	HILLSBORC	BOULEVARD	IMR						
Weaving c Weaving n Weaving s Freeway fr	onfiguration umber of lanes, l egment length, L ee-flow speed, F rsions to p	rs FS	r Base Co	Two-Sided 3 5085ft 70 mph	Terrain type				Freewa 240 Lev	
	V (veh/h)	PHF	Truck (%)	RV (%)	E _T	E _R	f _{HV}	fp	v (pc/h)	
V _{FF}	4055	0.95	3	0	1.5	1.2	0.985	1.00	4332	
V _{RF}	1105	0.92	2	0	1.5	1.2	0.990	1.00	1213	
V _{FR}	935	0.92	2	0	1.5	1.2	0.990	1.00	1026	
V _{RR}	125	0.92	2	0	1.5	1.2	0.990	1.00	137	
V _{NW}	6571						8	V =	6708	
V _W	137							<u></u>	<u>.</u>	
VR	0.020									
Config	uration Ch	aracteris	tics							
Minimum r	maneuver lanes,	N _{WL}		0 lc	Minimum we	aving lane c	hanges, LC _{MIN}		411 lc	
Interchang	je density, ID			0.7 int/mi	Weaving lan	e changes, L	.C _w		782 lc	
Minimum I	RF lane changes	, LC _{RF}		0 lc/pc	Non-weaving	g lane chang	es, LC _{NW}		3154 lc	
Minimum I	FR lane changes	, LC _{FR}		0 lc/pc	Total lane ch	nanges, LC _{AL}	L		3936 lc/	
Minimum I	RR lane changes	s, LC _{RR}		3 lc/pc	Non-weaving	g vehicle inde	ex, I _{NW}		233	
Weavir	ng Segmen	t Speed,	Density, I	Level of	Service,	and Cap	oacity			
•	egment flow rate			6622 veh/h 6904 veh/h	•	ensity factor, gment speed			0.18 56.4 mp	
-	segment v/c ratio	vv		0.959 0.959	• •	aving speed,			61.4 mp	
•	segment density,		39	0.959 9.6 pc/mi/ln	Average nor				56.3 mp	
•	ervice, LOS			E	Maximum w				5916	
Notes						0 - 0-	· IVIAA			

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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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 3-B No-Build	et Off & On Ramp
Project Description SW 10th					
✓ Oper.(LOS)			Des.(N)	Pla	anning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K	5160	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R	0.95 3 0	
Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	General Terrain: Grade % Length Up/Down %	u Level mi	
Calculate Flow Adjustr	nents				
f _p	1.00		E _R	1.2	
E _T	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
Speed Inputs			Calc Speed Adj and FFS	6	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f _{LW}		mph
Number of Lanes, N	3		f _{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			
LOS and Performance	Measures		Design (N)		
<u>Operational (LOS)</u> v _p = (V or DDHV) / (PHF x N : S D = v _p / S LOS	x f _{HV} x f _p) 1838 65.3 28.2 D	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	-	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-1

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		RAI	MPS AND		CTIONS W	ORKSHE	ET			
General	Inform	nation			Site Infor	mation				
nalyst				Fr	eeway/Dir of Tr	avel I-	95 SB			
gency or C		AECO	MC	Ju	nction	S	eg 4-Merge fro	om Hillsboro WB		
ate Perforn					risdiction					
nalysis Tim		PM		Ar	nalysis Year	N	lo-Build 2020			
	ription	SW 10th Stree	t SIMR							
nputs			Eroowov Numb	per of Lanes, N	3				<u> </u>	
pstream Ac	dj Ramp				3				Downstre	eam Adj
✓ Yes	🗌 On		Ramp Number		1				Ramp	
100			Acceleration La	- 11	950				🗌 Yes	On
No	🗹 Off		Deceleration L	ane Length L _D					✓ No	Off
			Freeway Volur	ne, V _F	5160					
- qu	2175 f	t	Ramp Volume	V _R	790				L _{down} =	ft
· _	4000	- I- <i>U</i> -	Freeway Free-	Flow Speed, S _{FF}	70.0				V _D =	veh/h
'u =	1060 v	en/n	Ramp Free-Flo	w Speed, S _{FR}	50.0				*D	VCII/II
convers	sion to	pc/h Und	der Base (Conditions					<u></u>	
(pc/h)	V	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PH	F x f _{HV} x f _p
	')	(Veh/hr)						· · · · · · · · · · · · · · · · · · ·		
reeway		5160	0.95	Level	3	0	0.985	1.00		5513
Ramp		790	0.92	Level	2	0	0.990	1.00		867
JpStream DownStrear	~	1060	0.92	Level	2	0	0.990	1.00		1164
JownStream	11		Merge Areas					Diverge Areas		
stimati	ion of					Estimatio	on of V ₄₀			
		$V_{12} = V_{F}$	(P)				. =			
_				40.0 an 40.7)			V ₁₂ :	= V _R + (V _F - V _R	P _{FD}	
EQ =				13-6 or 13-7)		L _{EQ} =		(Equation 13-	12 or 13-	13)
FM =			- ·	on (Exhibit 13-6)		P _{FD} =		using Equatio	on (Exhibit 1	13-7)
12 =		3330				V ₁₂ =		pc/h		
$_3$ or V $_{\rm av34}$		2183 17)	oc/h (Equatio	on 13-14 or 13-		$V_3^{}$ or $V_{av34}^{}$		pc/h (Equation 1	13-14 or 13-	17)
s V ₂ or V	~ > 2.700	pc/h? 🗌 Ye	s 🔽 No			Is V_3 or V_{av34}	> 2,700 pc/h?	Yes 🗌 No		
		V ₁₂ /2						□Yes □No		
				on 13-16, 13-		If Yes,V _{12a} =		pc/h (Equatio	n 13-16, ′	13-18, or
Yes,V _{12a} =		18, or						13-19)		
Capacity	y Cheo	cks				Capacity	Checks			
		Actual	Ca	apacity	LOS F?		Actua	al Caj	pacity	LOS F?
						V _F		Exhibit 13-	8	
V _{FC}		6380	Exhibit 13-8		No	V _{FO} = V _F -	V _R	Exhibit 13-	8	
FC	,					V _R		Exhibit 13	-	
								10		
low En	tering		fluence A			Flow Ent	r	erge Influen		
1/		Actual	i i	Desirable	Violation?	N/	Actual	Max Desi	irable	Violation?
V _{R12}		4197	Exhibit 13-8	4600:All	No	V ₁₂		Exhibit 13-8		
			nination (i	,				eterminatio		t F)
).0078 V ₁₂ - 0.0	0627 L _A		D	_R = 4.252 +	0.0086 V ₁₂ - 0	.009 L _D	
_R = 31	.9 (pc/mi/	′ln)				D _R = (pc	:/mi/ln)			
OS = D	(Exhibit 1	3-2)				LOS = (Ex	khibit 13-2)			
Speed D)eterm	ination				Speed De	eterminat	ion		
I _S = 0.4	485 (Exib	it 13-11)				D _s = (Ext	hibit 13-12)			
-		Exhibit 13-11)					h (Exhibit 13-1	2)		
		Exhibit 13-11)					h (Exhibit 13-1			
	• •	Exhibit 13-13)				-	h (Exhibit 13-1	,		
50			nts Reserved				Version 6 90	- /		ed: 5/21/2019

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_					
General Information			Site Information		
Analyst			Highway/Direction of Travel	1-95 SB	t WB On & EB On
Agency or Company	AECOM		From/To	Ramps	
Date Performed	PM		Jurisdiction	No-Build 2	2020
Analysis Time Period Project Description SW 10th			Analysis Year	NO-Dulla I	2020
✓ Oper.(LOS)			Des.(N)	Plan	ining Data
Flow Inputs			Des.(IV)		ining Data
Volume, V	5950	veh/h	Peak-Hour Factor, PHF	0.95	
AADT	0000	veh/day	%Trucks and Buses, P_{T}	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 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		ft			
Rt-Side Lat. Clearance		ft	f _{LW}		mph
Number of Lanes, N	3		f _{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			
LOS and Performance	Measures		Design (N)		
			Design (N)		
Operational (LOS)			Design LOS		
v _p = (V or DDHV) / (PHF x N x	c f _{HV} x f _p) <i>2119</i>	pc/h/ln	$v_p = (V \text{ or DDHV}) / (PHF x N x)$	$f_{\rm LN}$ (x $f_{\rm r}$)	pc/h/ln
S	60.2	mph	S	пv р⁄	mph
$D = v_p / S$	35.2	pc/mi/ln	$D = v_p / S$		pc/mi/In
LOS	E		Required Number of Lanes, N		p0/11/11
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 - Houny volume v _n - Flow rate	FFS - Free-flow	sneed	E _T - Exhibits 11-10, 11-11, 11-	-13	f _{LC} - Exhibit 11-9
4		-	f _p - Page 11-18		TRD - Page 11-1
LOS - Level of service	BFFS - Base fre	ee-now speed	LOS, S, FFS, v _p - Exhibits 11-	2, 11-3	
DDHV - Directional design ho			·		

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Genera	al Informati	on			Site Info	rmation				
Analyst Agency/Co Date Perfo Analysis T		AECO PM	М		Weaving Seg	Freeway/Dir of Travel I-95 SB Weaving Segment Location Seg 6- Bet Hillsboro & 10th Analysis Year No-Build 2020				
Project De Inputs	escription SW 10	th Street SIMI	२							
Weaving o Weaving r Weaving s Freeway f	configuration number of lanes, l segment length, L ree-flow speed, F	s FS		4 1830ft 70 mph	Terrain type				Freew 24 Lev	
Conve	rsions to p	1	1	1	r	-	1		·	
	V (veh/h)	PHF	Truck (%)	RV (%)	Ε _Τ	E _R	f _{HV}	fp	v (pc/h)	
V _{FF}	4700	0.95	3	0	1.5	1.2	0.985	1.00	5022	
V _{RF}	710	0.92	2	0	1.5	1.2	0.990	1.00	779	
V _{FR}	1250	0.92	2	0	1.5	1.2	0.990	1.00	1372	
V _{RR}	0	0.95	0	0	1.5	1.2	1.000	1.00	0	
V _{NW}	5022		•	-			-	V =	7173	
V _W	2151								-	
VR	0.300									
Config	uration Cha	aracteris	tics							
Minimum	maneuver lanes,	N _{WL}		2 lc	Minimum we	aving lane c	hanges, LC _{MIN}		779 lc	
Interchan	ge density, ID			0.7 int/mi	Weaving lan	e changes, L	.C _w		1152 lc	
Minimum	RF lane changes	, LC _{RF}		1 lc/pc	Non-weaving	g lane chang	es, LC _{NW}		1256 lc	
Minimum	FR lane changes	, LC _{FR}		0 lc/pc	Total lane ch	nanges, LC _{AL}	L		2408 lc	
Minimum	RR lane changes	s, LC _{RR}		lc/pc	Non-weaving	g vehicle inde	ex, I _{NW}		64	
Weavi	ng Segmen	t Speed,	Density,	Level of	Service,	and Cap	pacity			
Weaving	segment flow rate	e, V		7078 veh/h	Weaving inte	ensity factor,	W		0.28	
Weaving	segment capacity	, c _w		7885 veh/h		gment speed			56.4 mp	
Weaving	segment v/c ratio			0.898	-	aving speed,			57.9 mp	
-	segment density,	D	3	1.8 pc/mi/ln	Average nor	n-weaving sp	eed, S _{NW}		55.8 mp	
Level of S	Service, LOS			D	Maximum w	eaving length	n, L _{max}		5583	
Notes										
Chapter 13	segments longer f , "Freeway Merge	and Diverge Se	egments".	-		solated merge	and diverge are	eas using the	procedures of	
	mes that exceed th ersity of Florida, All	0 0		he level of se		0 TM Version		Conor	ated: 5/21/20	

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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 7-Be No-Build	et Off & On Ramp I 2020
Project Description SW 10t	h Street SIMR		-		
✓ Oper.(LOS)			Des.(N)	Pla	nning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K	5410	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R	0.95 3 0	
Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	General Terrain: Grade % Length Up/Down %	Level mi	
Calculate Flow Adjustr	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	\$	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f _{LW}		mph
Number of Lanes, N	3		f _{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			
LOS and Performance	Measures		Design (N)		
<u>Operational (LOS)</u> v _p = (V or DDHV) / (PHF x N S D = v _p / S LOS	x f _{HV} x f _p) 1927 63.9 30.2 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 fre	-	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-17

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	RA	MPS AND	RAMP JUN	CTIONS W	ORKSHE	ET			
General Infor	mation			Site Infor	mation				
Analyst			Fre	eeway/Dir of Tra	avel I-	95 SB			
gency or Company	AEC	OM	Ju	nction	S	eg 8-Merge fror	n 10th St		
ate Performed				risdiction					
nalysis Time Period			An	alysis Year	N	o-Build 2020			
Project Description <i> nputs</i> 	SW 10th Stree	t SIMR							
		Ereeway Num	ber of Lanes, N	3					
Jpstream Adj Ramp		Ramp Number						Downstre	eam Adj
🗹 Yes 🗌 Or	า	I .		1				Ramp	
	•	1	ane Length, L _A	1470				🗌 Yes	🗌 On
🗌 No 🛛 🗹 Of	f	1	ane Length L _D					🗹 No	Off
		Freeway Volur		5410					
_{up} = 2210	ft	Ramp Volume	, V _R	1220				L _{down} =	ft
/ — <u>1050</u> .	ich/h	Freeway Free-	Flow Speed, S _{FF}	70.0				V _D =	veh/h
' _u = 1250 ·	ven/n	Ramp Free-Flo	ow Speed, S _{FR}	50.0				.0	VOIMI
Conversion t	o pc/h Un	der Base (Conditions						
(pc/h)	V	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PH	F x f _{HV} x f _p
. ,	(Veh/hr)								
reeway	5410	0.95	Level	3	0	0.985	1.00		5780
Ramp	1220	0.92	Level	2	0	0.990	1.00		1339
JpStream DownStream	1250	0.92	Level	2	0	0.990	1.00		1372
JownStream		Merge Areas					I Diverge Areas		
stimation of	fv12				Estimatic	on of v_{42}			
	V ₁₂ = V _F	(P)							
-	.= .		12 G or 12 7				V _R + (V _F - V _R		
EQ =			13-6 or 13-7)		L _{EQ} =		(Equation 13-	12 or 13-	13)
FM =		÷ .	ion (Exhibit 13-6)		P _{FD} =		using Equatio	n (Exhibit 1	13-7)
12 =	3510				V ₁₂ =		pc/h		
₃ or V _{av34}	2270 17)	pc/n (Equation	on 13-14 or 13-		$V_3^{}$ or $V_{av34}^{}$		pc/h (Equation 1	3-14 or 13-	17)
s V ₃ or V _{av34} > 2,70		s 🗸 No			Is V_3 or V_{av34}	> 2,700 pc/h? [Yes 🗌 No		
s V ₃ or V _{av34} > 1.5							Yes 🗌 No		
⁵ Yes,V _{12a} =			on 13-16, 13-		If Yes,V _{12a} =		pc/h (Equation 3-19)	n 13-16, 1	13-18, or
120		13-19)					5-19)		
Capacity Che		1		1	Capacity	II.			
	Actual		apacity	LOS F?		Actual		bacity	LOS F?
					V _F	_	Exhibit 13-8	_	
V _{FO}	7119	Exhibit 13-8		No	V _{FO} = V _F -	V _R	Exhibit 13-8		
					V _R		Exhibit 13- 10	-	
low Entering	I a Morao In	I I	r02			oring Divo	rge Influen		<u> </u>
	Actual	ii .	Desirable	Violation?		Actual	Max Desi		Violation?
V _{R12}	4849	Exhibit 13-8	4600:All	Yes	V ₁₂		Exhibit 13-8		. isialion
evel of Serv						L Service De	eterminatio	n (if no	t F)
	0.00734 v _R + (1	1		-).0086 V ₁₂ - 0.		,
		12 0.0	A				12		
	,					/mi/ln)			
OS = D (Exhibit						hibit 13-2)			
Speed Deterr						eterminatio	סח		
l _S = 0.672 (Exi	bit 13-11)					nibit 13-12)			
R ⁼ 51.2 mph	(Exhibit 13-11)					n (Exhibit 13-12)			
₀ = 63.6 mph	(Exhibit 13-11)				S ₀ = mph	n (Exhibit 13-12))		
	(Exhibit 13-13)				S = mpł	n (Exhibit 13-13))		
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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 No-Build	et 10th & Exit to Exp 2020
Project Description SW 10th	h Street SIMR				
✓ Oper.(LOS)			Des.(N)	🗌 Pla	nning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D	6630	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain:	0.95 3 0 Level	
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	mi	
Calculate Flow Adjustr	nents				
f _p	1.00		E _R	1.2	
E _T	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
Speed Inputs			Calc Speed Adj and FFS	\$	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f _{LW}		mph
Number of Lanes, N	3		f _{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			
LOS and Performance	Measures		Design (N)		
<u>Operational (LOS)</u> v _p = (V or DDHV) / (PHF x N : S D = v _p / S LOS	x f _{HV} x f _p) 2361 54.4 43.4 E	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 fre	-	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

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		RAMP	S AND RAM	P JUNCTI	ONS WC	RKS	HEET			
General Info	ormation			Site Infor	mation					
Analyst			Fre	eeway/Dir of Tr	avel	I-95 SE	}			
Agency or Compar	ny AEC	OM		nction		Seg 10	- Diverge	to Express		
Date Performed				risdiction						
Analysis Time Peri			An	alysis Year		No-Bui	ld 2040			
Project Description	SW 10th Stree	et SIMR								
Inputs										
Upstream Adj	Ramp	Freeway Num Ramp Numbe	ber of Lanes, N r of Lanes, N	3 1					Downstrea Ramp	am Adj
✓ Yes	✓ On		ane Length, L _A	·					Yes	On
No	Off		ane Length L _D	300					✓ No	Off
L _{up} =	6000 ft	Freeway Volu	I	6630 700					L _{down} =	ft
-up	5000 It	Ramp Volume	i v	720					down	-
V _u =	1220 veh/h	-	-Flow Speed, S _{FF} ow Speed, S _{FR}	70.0 45.0					V _D =	veh/h
Conversion	to pc/h Un			10.0						
	V	PHF		0/ Truels	0/ D. /		f	f	v = V/PHF	vf vf
(pc/h)	(Veh/hr)		Terrain	%Truck	%Rv		f _{HV}	1.		Г
Freeway	6630	0.95	Level	3	0	_	985	1.00	70	
Ramp	720	0.92	Level	2	0		990	1.00	79	
UpStream	1220	0.92	Level	2	0	0.	990	1.00	13	39
DownStream		Merge Areas						Diverge Areas		
Estimation of		werge Areas			Estimat	tion o		Diverge Aleas		
					Lotinat					
	V ₁₂ = V _F							= V _R + (V _F - V _F		
- _{EQ} =	(Equa	ation 13-6 or	13-7)		L _{EQ} =		7	700.18 (Equati	on 13-12 o	r 13-13)
P _{FM} =	using	Equation (E	Exhibit 13-6)		P _{FD} =		0	.547 using Equ	uation (Exhi	bit 13-7)
/ ₁₂ =	pc/h				V ₁₂ =		4	230 pc/h		
V_3 or V_{av34}	pc/h (Equation 13	-14 or 13-17)		$V_3^{}$ or $V_{av34}^{}$		2	854 pc/h (Equ	ation 13-14	1 or 13-17
ls V ₃ or V _{av34} > 2, ⁻			,			_{مم} > 2,7		✓ Yes □ No		
Is V_3 or $V_{av34} > 1.5$								Yes Vo		
			-16, 13-18, or			•		384 pc/h (Equ	ation 13-16	\$ 13_18
f Yes,V _{12a} =	13-19)		10, 10 10, 01		If Yes,V _{12a} =	=		r 13-19)		, 10-10,
Capacity Ch	lecks				Capacit	y Ch	ecks			
	Actual	C	apacity	LOS F?			Actual	Ca	pacity	LOS F
					V _F		7084	Exhibit 13-8	7200	No
V _{FO}		Exhibit 13-8			$V_{FO} = V_{FO}$	- V _D	6294	Exhibit 13-8	7200	No
FU							790	Exhibit 13-1		No
-low Enterii	na Merae In	fluence A	r02					rge Influen		
	Actual	1	Desirable	Violation?	1 10W EI		Actual	Max Desirab		Violation
V _{R12}		Exhibit 13-8			V ₁₂		1230	Exhibit 13-8	4400:All	No
evel of Ser	l vice Detern		if not E)		-			eterminatio		
D _R = 5.475 +		•	,).0086 V ₁₂ - 0.	•)
		0.0070 v ₁₂ -	0.00027 L _A			••		12 - 0.	DOB LD	
) _R = (pc/mi/						1.1 (pc				
OS = (Exhibi							oit 13-2)			
Speed Deter					Speed L					
•	13 11)				ŭ		xhibit 13	-		
M _S = (Exibit	13-11)						/	40.40		
9	khibit 13-11)					9.7 mph	(Exhibit	13-12)		
S _R = mph (Ex	-						(Exhibit (Exhibit			
R ⁼ mph (Ex 0 ⁼ mph (Ex	khibit 13-11)				S ₀ = 7 ⁻	1.0 mph	-	13-12)		

	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	AECOM PM		Highway/Direction of Travel From/To Jurisdiction Analysis Year	I-95 SB Seg 11- No-Build	Bet Off Exp Off Sample 1 2020
Project Description SW 10th	Street SIMR				
✓ Oper.(LOS) Flow Inputs			Des.(N)	Pla	anning Data
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D	5910	veh/h veh/day veh/h	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade % Length Up/Down %	0.95 3 0 Level mi	
Calculate Flow Adjustm	nents				
f _p E _T	1.00 1.5		E _R f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	1.2 0.985	
Speed Inputs			Calc Speed Adj and FFS	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 I	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) 2105 60.5 34.8 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 hol	S - Speed D - Density FFS - Free-flow BFFS - Base fre ur volume	-	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11
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0	· · · · · · · · · · · · · · · · · · ·	RAMP	S AND RAM			RKS	HEET			
General Inf	ormation			Site Infor						
Analyst		<u></u>		eeway/Dir of Tr		I-95 SE				
Agency or Compa Date Performed	any AEC	OM		nction risdiction		Seg 12	- Diverge 1	o Sample Rd		
Analysis Time Pe	riod PM			alysis Year		No-Bui	ld 2020			
· ·	on SW 10th Stree	et SIMR	7.4			NO-Dui	10 2020			
nputs										
•	di Demo	Freeway Num	ber of Lanes, N	3					Downotroe	voa Adi
Upstream Ac	ij Ramp	Ramp Numbe		1					Downstrea Ramp	im Adj
✓ Yes	On		ane Length, L_{Δ}	I					•	
			- 11	050					Yes	On
No	✓ Off		ane Length L _D	250					✓ No	Off
		Freeway Volu	1	5910						сı
L _{up} =	2000 ft	Ramp Volume	, V _R	1110					L _{down} =	ft
V -	700	Freeway Free	-Flow Speed, S _{FF}	70.0					V _D =	veh/h
V _u =	720 veh/h	Ramp Free-Fl	ow Speed, S _{FR}	45.0					* D	ven/m
Conversior	n to pc/h Un	der Base (Conditions							
	V	PHF	Terrain	%Truck	%Rv		f	f	v = V/PHF	vf vf
(pc/h)	(Veh/hr)	РПГ	Terrain	70 TTUCK	70 FLV	_	f _{HV}	f _p	v – v/FTH	^ ' HV ^ ' p
reeway	5910	0.95	Level	3	0	0.	985	1.00	63	14
Ramp	1110	0.92	Level	2	0	0.	990	1.00	12	19
JpStream	720	0.92	Level	2	0	0.	990	1.00	79	90
DownStream				_						
- 4: 4:		Merge Areas			F ation of			Diverge Areas		
stimation	of V ₁₂				Estimat	ion o	r v ₁₂			
	V ₁₂ = V _F	(P _{FM})					V ₁₂ =	= V _R + (V _F - V _F	R)P _{FD}	
EQ =	(Equa	ation 13-6 or	13-7)		L _{EQ} =		(Equation 13-1	2 or 13-13)
-~~ FM =	using	Equation (E	Exhibit 13-6)		P _{FD} =		0	546 using Equ	uation (Exhi	bit 13-7)
/ ₁₂ =	pc/h	I V	,		V ₁₂ =			001 pc/h	(,
V_3 or V_{av34}	•	Fountion 13	-14 or 13-17)		V_3^{12} or V_{av34}^{12}			313 pc/h (Equ	ation $13_1/$	or 13-17
	2,700 pc/h? 🔲 Ye					> 2 7		Yes ☑ No		101 10-17
						•••				
	1.5 * V ₁₂ /2 □ Ye		-16, 13-18, or			•		Yes No	12 16 12	10 or 12
Yes,V _{12a} =	13-19		-10, 13-10, 01		If Yes,V _{12a} =	=		oc/h (Equation 9)	13-10, 13-	10, 01 13
Capacity C		/			Capacit	v Ch		• /		
	Actual	С	apacity	LOS F?	1	<u> </u>	Actual	Ca	pacity	LOS F
					V _F		6314	Exhibit 13-8		No
V _{FO}		Exhibit 13-8			$V_{FO} = V_{F}$	- V	5095	Exhibit 13-8	_	No
* FO						*R			_	
					V _R		1219	Exhibit 13-1		No
low Enter	ing Merge Ir				Flow En	- I		rge Influen		1 10 10
	Actual	1	Desirable	Violation?			Actual	Max Desirab		Violation
V _{R12}		Exhibit 13-8			V ₁₂		1001	Exhibit 13-8	4400:All	No
	rvice Deterr		1		1			terminatio		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	
_R = (pc/m	i/ln)				D _R = 38	8.1 (pc	/mi/ln)			
OS = (Exhib	oit 13-2)				LOS = E	(Exhit	oit 13-2)			
	ermination				Speed L			on		
							xhibit 13			
0	t 13-11)					-				
	Exhibit 13-11)					-	(Exhibit	-		
					<u> </u>	<u> </u>				
₀ = mph (E	Exhibit 13-11)				, i i i i i i i i i i i i i i i i i i i		(Exhibit	-		
₎ = mph (E	Exhibit 13-11) Exhibit 13-13)				, i i i i i i i i i i i i i i i i i i i		(Exhibit (Exhibit	-		

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 13-E No-Build	Bet Off & On Ramps 2020
Project Description SW 10th	h Street SIMR				
✓ Oper.(LOS)			Des.(N)	🗌 Pla	nning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D	4800	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain:	0.95 3 0 Level	
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	mi	
Calculate Flow Adjustr	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		ft			
Rt-Side Lat. Clearance		ft	f _{LW}		mph
Number of Lanes, N	3		f _{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			
LOS and Performance	Measures		Design (N)		
<u>Operational (LOS)</u> v _p = (V or DDHV) / (PHF x N x S D = v _p / S LOS	x f _{HV} x f _p) 1709 67.0 25.5 C	pc/h/ln mph pc/mi/ln	$\frac{\text{Design (N)}}{\text{Design LOS}}$ $v_p = (V \text{ or DDHV}) / (PHF x N x)$ 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	-	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-17

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Analyst Agency/Co Date Perfo Analysis T		AECO PM	Μ		Freeway/Dir of TravelI-95 SBWeaving Segment LocationSeg 14- Bet Sample & CopansAnalysis YearNo-Build 2020				
Project De Inputs	scription SW 10th	h Street SIM	२						
Weaving c Weaving n Weaving s	onfiguration umber of lanes, N egment length, L _s ee-flow speed, Ff	3		One-Sided 4 1650ft 70 mph		nimum speed aximum capac			Freeway 15 2400 Leve
Conve	rsions to po	c/h Unde	r Base Co	onditions					
	V (veh/h)	PHF	Truck (%)	RV (%)	Ε _Τ	E _R	f _{HV}	fp	v (pc/h)
V _{FF}	4170	0.95	3	0	1.5	1.2	0.985	1.00	4455
V _{RF}	1420	0.92	2	0	1.5	1.2	0.990	1.00	1559
V _{FR}	630	0.92	2	0	1.5	1.2	0.990	1.00	692
V _{RR}	0	0.95	0	0	1.5	1.2	1.000	1.00	0
V _{NW}	4455							V =	6706
V _W	2251								•
VR	0.336								
Config	uration Cha	aracteris	tics		-				
Minimum ı	maneuver lanes, l	N _{WL}		2 lc	Minimum w	eaving lane c	hanges, LC _{MIN}		2251 lc/h
Interchang	ge density, ID			0.7 int/mi	Weaving la	ne changes, L	.C _w		2602 lc/ł
Minimum I	RF lane changes,	$\mathrm{LC}_{\mathrm{RF}}$		1 lc/pc	Non-weavir	ng lane chang	es, LC _{NW}		1042 lc/h
Minimum I	FR lane changes,	$\rm LC_{FR}$		1 lc/pc	Total lane c	hanges, LC _{AL}	L		3644 lc/ł
Minimum I	RR lane changes,	LC _{RR}		lc/pc	Non-weavir	ng vehicle inde	ex, I _{NW}		515
Weavir	ng Segment	t Speed,	Density,	Level of	Service	, and Cap	oacity		
Weaving s	segment flow rate,	, V		6618 veh/h	•	tensity factor,			0.422
Weaving s	segment capacity,	c _w		7044 veh/h	•	gment speed			48.1 mpł
•	egment v/c ratio	_	_	0.939	-	aving speed,			53.7 mpł
•	egment density, I	D	3	•	-	n-weaving sp	1111		45.7 mpł
	ervice, LOS			D	Maximum w	veaving length	n, L _{MAX}		5970 f
Notes a. Weaving	segments longer th	nan the calculation of the calcu		ength should b	e treated as i	isolated merge	and diverge are	eas using the	procedures of

			FREEWA	Y WEAV			T			
Genera	al Informati	on			Site Info	rmation				
-	ormed ime Period	AECO AM			Weaving Seg	Freeway/Dir of Travel I-95 NB Weaving Segment Location Seg 1-Bet Copans & Sar Analysis Year No-Build 2040				
Project De Inputs	escription SW 10	th Street SIM	२							
Weaving r Weaving s Freeway f	configuration number of lanes, l segment length, L ree-flow speed, F	s FS		One-Sided 4 1820ft 70 mph	Segment typ Freeway min Freeway ma: Terrain type	imum speed			Freew 24 Lev	
Conve	rsions to p	1		1	1	_				
	V (veh/h)	PHF	Truck (%)	RV (%)	Ε _Τ	E _R	f _{HV}	fp	v (pc/h)	
V _{FF}	4755	0.95	3	0	1.5	1.2	0.985	1.00	5080	
V _{RF}	405	0.92	2	0	1.5	1.2	0.990	1.00	445	
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}	5080							V =	6590	
V _W	1510									
VR	0.229									
Config	uration Cha	aracteris	tics		1					
Minimum	maneuver lanes,	N _{WL}		2 lc	Minimum we	aving lane c	hanges, LC _{MIN}		1510 lc	
Interchan	ge density, ID			0.7 int/mi	Weaving lan	e changes, L	_C _w		1882 lc	
Minimum	RF lane changes	, LC _{RF}		1 lc/pc	Non-weaving	g lane chang	es, LC _{NW}		1263 lc	
Minimum	FR lane changes	, LC _{FR}		1 lc/pc	Total lane ch	nanges, LC _{AL}	L		3145 lc	
Minimum	RR lane changes	s, LC _{RR}		lc/pc	Non-weaving	g vehicle inde	ex, I _{NW}		64	
Weavii	ng Segmen	t Speed,	Density,	Level of	Service,	and Cap	pacity			
Weaving	segment flow rate	9, V		6500 veh/h	Weaving inte	•			0.34	
Weaving	segment capacity	ν, c _w		8548 veh/h	Weaving see				52.2 mp	
Weaving	segment v/c ratio			0.760	Average wea				55.8 mp	
-	segment density,	D	3	1.6 pc/mi/ln	Average nor				51.2 mp	
Level of S	Service, LOS			D	Maximum w	eaving length	n, L _{MAX}		4836	
Notes										
Chapter 13	segments longer f , "Freeway Merge	and Diverge S	egments".	0		solated merge	and diverge are	eas using the	procedures of	
	mes that exceed the ersity of Florida All	0 0		ne level of sei					erated: 5/22/2	

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	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company	AECOM		Highway/Direction of Travel From/To	l-95 NB Seg 2-Be Sample	t Off & On from
Date Performed Analysis Time Period	AM		Jurisdiction Analysis Year	No-Build	2040
Project Description SW 10th	h Street SIMR				
Oper.(LOS)			Des.(N)	🗌 Plar	nning Data
Flow Inputs					
/olume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D	5160	veh/h veh/day veh/h	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade % Length Up/Down %	0.95 3 0 Level mi	
Calculate Flow Adjustn	nonte		op/bottin /o		
•				1.0	
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		
_ane 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		10.0	
OS 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) 1838 65.3 28.2 D	pc/h/ln mph pc/mi/ln	Design (N) Design LOS v _p = (V or DDHV) / (PHF x N x S D = v _p / S Required Number of Lanes, N	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	-	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11
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		RAM	MPS AND	RAMP JUN	CTIONS W	ORKSHE	EET				
General	Inform	nation			Site Infor	mation					
Analyst				Fr	eeway/Dir of Tra	avel	I-95 N	IB			
gency or Co		AECO	DM	Ju	Inction	;	Seg 3	-On Ramp f	rom Sample		
ate Perform					irisdiction						
nalysis Tim		AM		Ar	nalysis Year		No-Bu	uild 2040			
nputs	ription a	SW 10th Street	I SIMR								
			Freeway Num	ber of Lanes, N	3						
Jpstream Ad	lj Ramp									Downstre	eam Adj
Yes	On		Ramp Numbe		1					Ramp	
				ane Length, L _A	500					🗹 Yes	🗹 On
✓ No	Off			ane Length L _D						🗌 No	Off
	_		Freeway Volu		5160						
up =	ft		Ramp Volume	e, V _R	1460					L _{down} =	1950 ft
/ _	vob/b		Freeway Free	-Flow Speed, S _{FF}	70.0					V _D =	920 veh/h
/ _u =	veh/h		Ramp Free-Fl	ow Speed, S _{FR}	50.0					·D	520 VCII/II
Convers	sion to	pc/h Und	ler Base	Conditions							
(pc/h		V	PHF	Terrain	%Truck	%Rv		f _{HV}	f _p	v = V/PH	F x f _{HV} x f _p
	<u>′</u>	(Veh/hr)					+_		'		
reeway		5160	0.95	Level	3	0).985	1.00		5513 1602
Ramp JpStream		1460	0.92	Level	2	0).990	1.00		1603
DownStream	n	920	0.92	Level	2	0	0).990	1.00		1010
Jownotican			Merge Areas	Level	2	0			liverge Areas		1010
stimati	ion of	V12				Estimati	ion d				
		$V_{12} = V_F ($	(P)								
_				- 10 7)				V ₁₂ = V	V _R + (V _F - V _R)P _{FD}	
EQ =			ation 13-6 or			L _{EQ} =		(Equation 13-	12 or 13-	13)
P _{FM} =				ion (Exhibit 13-6)		P _{FD} =		ι	using Equatio	n (Exhibit 1	3-7)
/ ₁₂ =		3261 p		10.11.10		V ₁₂ =		F	oc/h		
V_3 or V_{av34}		2252 p 17)	oc/n (Equation	on 13-14 or 13-		$V_3^{}$ or $V_{av34}^{}$			oc/h (Equation 1	3-14 or 13-	17)
s V ₂ or V ₂₂	× 2.700	pc/h? Yes	No.			Is V_3 or V_{av3}	₄ > 2,7	700 pc/h?	Yes No		
		V ₁₂ /2 √ Yes				Is V_3 or V_{av3}	3 ₄ > 1.8	5 * V ₁₂ /2	Yes No		
				on 13-16, 13-		If Yes,V _{12a} =		F	oc/h (Equatio	n 13-16, 1	3-18, or
f Yes,V _{12a} =		18, or		011 10 10, 10		11 1 00, 1 12a		1:	3-19)		
Capacity	y Chec	cks				Capacity	y Ch	necks			
		Actual	C	apacity	LOS F?			Actual	Cap	oacity	LOS F?
						V _F			Exhibit 13-8	3	
V _{F0}		7116	Exhibit 13-8		No	$V_{FO} = V_{F}$	- V _R		Exhibit 13-8	3	
FO	,	1110			110	V _R			Exhibit 13-	-	
						<u> </u>			10		
-low En	tering	Merge In	ii .			Flow En	1		rge Influen		11
		Actual	1	Desirable	Violation?		+	Actual	Max Desi	rable	Violation?
V _{R12}		4864	Exhibit 13-8	4600:All	Yes	V ₁₂			Exhibit 13-8		
		ce Detern		1					terminatio		t F)
		0.00734 v _R + 0	0.0078 V ₁₂ - 0.0	00627 L _A					.0086 V ₁₂ - 0.	009 L _D	
0 _R = 39	.5 (pc/mi/	'ln)				D _R = (p	c/mi/	ln)			
OS = E ((Exhibit 1	3-2)				LOS = (E	xhibi	it 13-2)			
Speed D)eterm	ination				Speed D)eter	rminatic	n		
1 _s = 0.7	776 (Exibi	it 13-11)				D _s = (E:	xhibit	13-12)			
	•	Exhibit 13-11)						, hibit 13-12)			
		Exhibit 13-11)					•	(hibit 13-12)			
L= 62						• U					
•	• •	Exhibit 13-13)				S= mo	oh (Ex	hibit 13-13)			

General Information			Site Information		
Analyst			Highway/Direction of Travel	I-95 NB	
Agency or Company	AECOM		From/To		et On from Sample &
Date Performed	AECOM		Jurisdiction	Exp	
Analysis Time Period	AM		Analysis Year	No-Build	2040
Project Description SW 10th	n Street SIMR				
✓ Oper.(LOS)			Des.(N)	Pla	nning Data
Flow Inputs					
Volume, V	6620	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			General Terrain:	Level	
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	mi	
	4 .				
Calculate Flow Adjustn					
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	
_ane 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			r
LOS and Performance	Measures		Design (N)		
			Design (N)		
Operational (LOS)			Design LOS		
v _p = (V or DDHV) / (PHF x N x	(f _{HV} x f _p) 2358	pc/h/ln	$v_p = (V \text{ or DDHV}) / (PHF x N x)$	fxf)	pc/h/ln
S	54.4	mph	S	.HA Vb,	mph
D = v _p / S	43.3	pc/mi/ln	$D = v_p / S$		pc/mi/ln
LOS	E		Required Number of Lanes, N		permini
			•		
Glossary			Factor Location		
N - Number of lanes	S - Speed		E _R - Exhibits 11-10, 11-12		f _{I w} - Exhibit 11-8
V - Hourly volume	D - Density		$E_{\rm R}$ - Exhibits 11-10, 11-11, 11-	13	$f_{\rm LC}$ - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow	speed	f_{n} - Page 11-18	10	TRD - Page 11-11
LOS - Level of service	BFFS - Base fre	ee-flow speed	٩	2 11 2	IND - Faye II-II
DDHV - Directional design ho	ur volume		LOS, S, FFS, v _p - Exhibits 11-2	∠, 11-3	

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		RAI		RAMP JUN	CTIONS W	ORKSHE	ET				
Genera	l Infor	nation			Site Infor	mation					
Analyst				Fr	eeway/Dir of Tra	avel I	-95 NB				
Agency or C		AECO	MC		nction	9	Seg 5-Or	n from Exp			
Date Perfor					risdiction						
Analysis Tir		AM		Ar	nalysis Year	1	lo-Build	2040			
^p roject Des Inputs	scription	SW 10th Stree	(SINK								
			Freeway Num	ber of Lanes, N	3				1		
Jpstream A	Adj Ramp		Ramp Numbe		1					Downstre	eam Adj
Yes	🗌 On				1					Ramp	
				ane Length, L _A	600					🗹 Yes	🗌 On
🗸 No	🗌 Off			ane Length L _D						🗌 No	✓ Off
	~		Freeway Volu	1	6620						
-up =	ft		Ramp Volume	i v	920					L _{down} =	5545 ft
/ _u =	veh/h		Freeway Free	-Flow Speed, S _{FF}	70.0					V _D =	1320 veh/h
′u —	Veniin		Ramp Free-Fl	ow Speed, S _{FR}	50.0					D	1020 10101
Conver	rsion to	o pc/h Und	der Base	Conditions						-	
(pc/	/h)	V	PHF	Terrain	%Truck	%Rv	f⊾	١V	f _p	v = V/PH	F x f _{HV} x f _p
Freeway	,	(Veh/hr) 6620	0.95	Level	3	0	0.98		ې 1.00		7073
Ramp		920	0.95	Level	2	0	0.90		1.00		1010
UpStream		920	0.92	Levei	2	0	0.98		1.00		1010
DownStrea	am	1320	0.92	Level	2	0	0.99	90	1.00		1449
			Merge Areas				0.00		verge Areas		
Estimat	tion of	V ₁₂				Estimatio	on of				
		$V_{12} = V_{F}$	(P)								
=				13-6 or 13-7)					_R + (V _F - V _R)		
- _{EQ} =				ion (Exhibit 13-6)		L _{EQ} =		-	quation 13-		-
P _{FM} = / =		4367	÷ .			P _{FD} =			ing Equation	n (Exhibit 1	13-7)
/ ₁₂ =		•		on 13-14 or 13-		V ₁₂ =		рс	:/h		
V_3 or V_{av34}		17)	John (Equality	01113-14-0113-		$V_3^{}$ or $V_{av34}^{}$			h (Equation 1	3-14 or 13-	17)
Is V_3 or V_{a_1}	_{v34} > 2,700) pc/h? 🗹 Ye	s 🗌 No			Is V_3 or V_{av34}	₄ > 2,700) pc/h? 📃	Yes 🗌 No		
Is V ₃ or V _a	_{v34} > 1.5 *	V ₁₂ /2	s 🗌 No			Is V_3 or V_{av3^2}	₄ > 1.5 *	V ₁₂ /2	Yes 🗌 No		
f Yes,V _{12a} :				on 13-16, 13-		If Yes,V _{12a} =			/h (Equatior	n 13-16, <i>1</i>	13-18, or
		18, or	13-19)						19)		
Capacit	ty Che		•			Capacity	Che	cks			
		Actual	C	Capacity	LOS F?			Actual		acity	LOS F?
						V _F			Exhibit 13-8	_	
VF	o	8083	Exhibit 13-8		Yes	V _{FO} = V _F -	· V _R		Exhibit 13-8		
						V _R			Exhibit 13-	·	
		Maraala	l fluonoo A						10		
	litering	Actual	1	Desirable	Violation?	riow Ent		tual	te Influen Max Desir		Violation?
V _{R1}		5907	Exhibit 13-8	4600:All	Yes	V ₁₂	AC		Exhibit 13-8		violation?
					165		Sori			n (if no	<u> </u>
				,					erminatio		<i>LT</i>)
		0.00734 v _R + (1.0070 v ₁₂ - 0.1	00027 L _A					086 V ₁₂ - 0.	009 L _D	
	7.3 (pc/mi						c/mi/ln)				
	Exhibit 1	,					xhibit 1				
Speed I	Determ	nination				Speed D	eterm	ninatior	ו		
∕l _S = 1	.695 (Exib	it 13-11)				D _s = (Ex	hibit 13-	·12)			
	•	, Exhibit 13-11)				S _R = mp	h (Exhib	it 13-12)			
		Exhibit 13-11)					h (Exhib	it 13-12)			
	• •	Exhibit 13-13)				-	h (Exhib	it 13-13)			
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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 NB Seg 6-Bo No-Build	et Exp On & Off to 10tl I 2040
Project Description SW 10th	n Street SIMR				Inning Data
Flow Inputs			Des.(N)		inning Data
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D	7540	veh/h veh/day veh/h	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade % Length Up/Down %	0.95 3 0 Level mi	
Calculate Flow 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	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		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	-	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11
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		RAMP	S AND RAM	P JUNCTI	ONS WC	ORKS	HEET			
General Info	rmation			Site Infor	mation					
Analyst			Fre	eeway/Dir of Tr	avel	I-95 NE	3			
Agency or Company	y AEC	OM		inction		Seg 7-	Off Ramp t	o 10th St		
Date Performed				irisdiction						
Analysis Time Perio			An	nalysis Year		No-Bui	ld 2040			
Project Description	SW 10th Stree	I SIIVIR								
Inputs										
Upstream Adj F	Ramp	Ramp Numbe	ber of Lanes, N r of Lanes, N	3 1					Downstrea Ramp	m Adj
Yes	On		ane Length, L _A						✓ Yes	🗹 On
✓ No	Off	Deceleration L	ane Length L _D	250					□ No	Off
I -	ft	Freeway Volu	1	7540						1370 ft
L _{up} =	n	Ramp Volume		1320					down	10/0 11
V,, = \	veh/h	-	-Flow Speed, S _{FF}	70.0					V _D =	1660 veh
u		Ramp Free-Fl	ow Speed, S _{FR}	45.0					D	
Conversion t	to pc/h Une	<u>der Base (</u>	Conditions		-					
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv		f _{HV}	f _p	v = V/PHF	x f _{HV} x f _p
Freeway	7540	0.95	Level	3	0	0.	985	1.00	805	56
Ramp	1320	0.92	Level	2	0	0.	990	1.00	144	49
UpStream										
DownStream	1660	0.92	Level	2	0	0.	990	1.00	182	22
		Merge Areas						Diverge Areas		
Estimation o	of v ₁₂				Estimat	tion o	f v ₁₂			
	V ₁₂ = V _F	(P _{EM})					V ₁₂ =	: V _R + (V _F - V _F)P _{ED}	
=	12 1	ation 13-6 or	13-7)		L _{EQ} =			Equation 13-1		
- _{EQ} =		Equation (E			$P_{FD} =$			492 using Equ		
P _{FM} =	e e				$V_{12} =$			599 pc/h		
/ ₁₂ =	pc/h		4.4.4.4.7					•		40 47
V_3 or V_{av34}			-14 or 13-17)		V_3 or V_{av34}	. 0 7		357 pc/h (Equ	ation 13-14	or 13-17
Is V_3 or $V_{av34} > 2,7$								Yes No		
Is V ₃ or V _{av34} > 1.5			10 10 10		is v ₃ or v _{av}	_{/34} > 1.5		Yes No		
f Yes,V _{12a} =	pc/n (13-19)		-16, 13-18, or		If Yes,V _{12a} :	=		356 pc/h (Equ r 13-19)	ation 13-16	, 13-18,
Capacity Ch	,				Capacit	ty Ch		10-10)		
bupacity en	Actual	0	apacity	LOS F?		.y on	Actual	Ca	pacity	LOS F
	7101001	1 Ť	apaony		V _F		8056	Exhibit 13-8	· · · · · · · · · · · · · · · · · · ·	Yes
N /		Exhibit 13-8			$V_{FO} = V_{FO}$			Exhibit 13-8		
V					I FO F	= " R	6607			No
V _{FO}					-					
					V _R		1449	Exhibit 13-1		No
					V _R	nterin	g Dive	rge Influen	ce Area	
Flow Enterin	ig Merge In Actual	Max	rea Desirable	Violation?	V _R Flow Er	nterin	g Dive Actual	rge Influen Max Desirat	ce Area	Violation
Flow Enterin V _{R12}	Actual	Max Exhibit 13-8	Desirable	Violation?	V _R Flow Er	nterin	g Dive Actual 1699	rge Influen Max Desirat Exhibit 13-8	ce Area ble 4400:All	Violation' Yes
Flow Enterin V _{R12} Level of Serv	Actual	Max Exhibit 13-8 mination (i	Desirable if not F)	Violation?	V _R Flow Er	nterin	g Dive Actual 1699	rge Influen Max Desirat	ce Area ble 4400:All	Violation Yes
Flow Enterin V _{R12}	Actual	Max Exhibit 13-8 mination (i	Desirable if not F)	Violation?	V _R Flow Er V ₁₂ Level o	nterin / / f Serv	g Dive Actual 4699 /ice De	rge Influen Max Desirat Exhibit 13-8	ce Area ble 4400:All n (if not F	Violation Yes
Flow Enterin V _{R12} Level of Serv D _R = 5.475 + 0	Actual vice Detern 0.00734 v _R +	Max Exhibit 13-8 mination (i	Desirable if not F)	Violation?	V _R Flow Er V ₁₂ Level o	nterin / / f Serv	g Dive Actual 1699 /ice De 1.252 + 0	rge Influen Max Desirat Exhibit 13-8 terminatio	ce Area ble 4400:All n (if not F	Violation Yes
Flow Enterin V _{R12} Level of Serv D _R = 5.475 + 0 D _R = (pc/mi/li	Actual vice Detern 0.00734 v _R + n)	Max Exhibit 13-8 mination (i	Desirable if not F)	Violation?	V_{R} Flow Er V_{12} Level or $D_{R} = 4$	nterin 7 f Serv D _R = 4 8.1 (pc.	g Dive Actual 1699 /ice De 1.252 + 0	rge Influen Max Desirat Exhibit 13-8 terminatio	ce Area ble 4400:All n (if not F	Violation Yes
Flow Enterin V_{R12} Level of Servent $D_R = 5.475 + 0$ $D_R = (pc/mi/lit)$ $O_R = (Exhibit)$	Actual vice Detern 0.00734 v _R + n) : 13-2)	Max Exhibit 13-8 mination (i	Desirable if not F)	Violation?	V _R Flow Er V ₁₂ Level or D _R = 4 LOS = F	<i>iterin</i> <i>f</i> Serv D _R = 4 8.1 (pc.	g Dive Actual 1699 /ice De 1.252 + 0 /mi/ln) bit 13-2)	rge Influen Max Desirat Exhibit 13-8 terminatio .0086 V ₁₂ - 0.	ce Area ble 4400:All n (if not F	Violation Yes
Flow Enterin V_{R12} Level of Serv $D_R = 5.475 + 0$ $D_R = (pc/mi/li LOS = (ExhibitSpeed Deterv$	Actual vice Detern 0.00734 v _R + n) : 13-2) mination	Max Exhibit 13-8 mination (i	Desirable if not F)	Violation?	V_{R} Flow Er V_{12} Level or $D_{R} = 4$ LOS = F Speed I	nterin f Serv D _R = 4 8.1 (pc. (Exhit	g Dive Actual 4699 /ice De 1.252 + 0 /mi/ln) Dit 13-2) minatic	rge Influen Max Desirab Exhibit 13-8 termination .0086 V ₁₂ - 0.	ce Area ble 4400:All n (if not F	Violation Yes
Flow Enterin V_{R12} Level of Serve $D_R = 5.475 + 0$ $D_R = (pc/mi/ling)$ OS = (Exhibit) Speed Deterve $M_S = (Exibit)$	Actual vice Detern 0.00734 v _R + n) 13-2) mination 13-11)	Max Exhibit 13-8 mination (i	Desirable if not F)	Violation?	V_{R} Flow Er V_{12} Level or $D_{R} = 4$ LOS = F Speed I $D_{s} = 0$	nterin f Serv D _R = 4 8.1 (pc. (Exhite Deter .428 (E	g Dive Actual 1699 /ice De 1.252 + 0 /mi/ln) bit 13-2) minatic xhibit 13	rge Influen Max Desirat Exhibit 13-8 terminatio .0086 V ₁₂ - 0.	ce Area ble 4400:All n (if not F	Violation Yes
Flow Enterin V_{R12} Level of Serv $D_R = 5.475 + 0$ $D_R = (pc/mi/li .OS = (Exhibit Speed Detern M_S = (Exibit 1)S_R = mph (Exi$	Actual vice Detern 0.00734 v _R + n) : 13-2) mination 13-11) hibit 13-11)	Max Exhibit 13-8 mination (i	Desirable if not F)	Violation?	V_{R} Flow Er V_{12} Level or $D_{R} = 4$ LOS = F Speed I $D_{s} = 0$ $S_{R} = 5$	f Serv D _R = 4 8.1 (pc (Exhit Deter .428 (E 8.0 mph	g Dive Actual 1699 1.252 + 0 /mi/ln) bit 13-2) minatic xhibit 13- (Exhibit	rge Influen Max Desirab Exhibit 13-8 termination .0086 V ₁₂ - 0. 000 -12) 13-12)	ce Area ble 4400:All n (if not F	Violation Yes
Flow Enterin V_{R12} Level of Serve $D_R = 5.475 + 0$ $D_R = (pc/mi/lit)$ OS = (Exhibit) Speed Detern $M_S = (Exibit)$ $M_S = (Exibit)$ $D_R = mph (Exist)$	Actual vice Detern 0.00734 v _R + n) 13-2) mination 13-11)	Max Exhibit 13-8 mination (i	Desirable if not F)	Violation?	V_R Flow Er V_{12} Level or $D_R = 4$ LOS = F Speed I $D_s = 0$ $S_R = 5$ $S_0 = 7$	terin f Serv D _R = 4 8.1 (pc. (Exhite Deter .428 (E 8.0 mph 0.2 mph	g Dive Actual 1699 /ice De 1.252 + 0 /mi/ln) bit 13-2) minatic xhibit 13	rge Influen Max Desirat Exhibit 13-8 terminatio .0086 V ₁₂ - 0. 000 -12) 13-12) 13-12)	ce Area ble 4400:All n (if not F	Violation Yes

	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	AECOM AM		Highway/Direction of Travel From/To Jurisdiction Analysis Year	I-95 NB Seg 8-B No-Build	et Off & On 10th St I 2040
Project Description SW 10th	Street SIMR				
Oper.(LOS)			Des.(N)	∐ Pla	inning Data
<i>Flow Inputs</i> Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D	6220	veh/h veh/day veh/h	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade % Length Up/Down %	0.95 3 0 Level mi	
Calculate Flow Adjustm	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	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 I	Measures		Design (N)		
<u>Operational (LOS)</u> v _p = (V or DDHV) / (PHF x N x S D = v _p / S LOS		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 hol	S - Speed D - Density FFS - Free-flow BFFS - Base fro ur volume	-	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11
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	RA	MPS AND	RAMP JUN		ORKSHEE	T			
General Info	ormation			Site Infor	mation				
Analyst			Fre	eeway/Dir of Tr	avel I-9	5 NB			
gency or Compar	iy AEC	OM	Ju	nction	Se	g -On Ramp 10	th St EB & WB		
ate Performed				risdiction					
nalysis Time Peri			An	alysis Year	No	-Build 2040			
Project Description	SW 10th Stree	et SIMR							
nputs			N					1	
Jpstream Adj Ram	p	1 '	ber of Lanes, N	3				Downstre	eam Adj
✓Yes 🗌)n	Ramp Number		1				Ramp	
	211		ane Length, L _A	1345				🗌 Yes	🗌 On
No 🗸 🗸	Off	Deceleration L	ane Length L _D					🗹 No	Off
		Freeway Volu	ne, V _F	6220					
_{up} = 1370	ft	Ramp Volume	, V _R	1660				L _{down} =	ft
/		Freeway Free	Flow Speed, S _{FF}	70.0				V _D =	veh/h
/ _u = 1320	veh/h	Ramp Free-Flo	ow Speed, S _{FR}	50.0				▼D [−]	VEII/II
Conversion	to pc/h Un	der Base (Conditions						
	V			% Truck	0/ Dv	f	f	у = \//DH	Evf vf
(pc/h)	(Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	r.		F x f _{HV} x f _p
Freeway	6220	0.95	Level	3	0	0.985	1.00		6646
Ramp	1660	0.92	Level	2	0	0.990	1.00		1822
UpStream	1320	0.92	Level	2	0	0.990	1.00		1449
DownStream									
Estimation		Merge Areas			Estimatio		iverge Areas		
stimation o					Estimation	12			
	V ₁₂ = V _F	(P _{FM})				$V_{12} = V_{12}$	/ _R + (V _F - V _R))P _{ED}	
EQ =	2622.33	3 (Equation	13-6 or 13-7)		L _{EQ} =		Equation 13-	. 5	13)
P _{FM} =	0.536	using Equat	ion (Exhibit 13-6)		$P_{FD} =$	-	ising Equatio		-
′ ₁₂ =	3563	pc/h			V ₁₂ =		oc/h		/
V_3 or V_{av34}		pc/h (Equatio	on 13-14 or 13-		V_3 or V_{av34}	-	oc/h (Equation 1	3-14 or 13-	17)
	17)					> 2,700 pc/h?		0 11 01 10	,
s V ₃ or V _{av34} > 2,									
ls V ₃ or V _{av34} > 1.9						> 1.5 * V ₁₂ /2 r	c/h (Equation	n 13_16 1	3-18 or
f Yes,V _{12a} =		pc/h (Equatio 13-19)	on 13-16, 13-		If Yes,V _{12a} =		B-19)	110 10, 1	0 10, 01
Capacity Ch		13-19)			Capacity	Chacks			
Supacity Ch	Actual	C C	apacity	LOS F?		Actual	Car	pacity	LOS F?
	Actual	ŤŤ	apacity	LOOT	V _F	Actual	Exhibit 13-8	1	2001:
					· · · · · · · · · · · · · · · · · · ·	/	_	_	_
V_{FO}	8468	Exhibit 13-8		Yes	$V_{FO} = V_F - V_F$	^v R	Exhibit 13-8		
					V _R		Exhibit 13- 10	·	
-low Enterii	na Merae Ir	fluence A	rea		Flow Ente	rina Diver	ge Influen	ce Area)
	Actual	1	Desirable	Violation?		Actual	Max Desi		Violation?
V _{R12}	5768	Exhibit 13-8	4600:All	Yes	V ₁₂		Exhibit 13-8		
evel of Ser	vice Deterr					Service De	terminatio	n (if not	t F)
	+ 0.00734 v _R + 0		,				0086 V ₁₂ - 0.		· · · /
0 _R = 41.2 (pc)		12 0.0	A			mi/ln)	12 0.	D	
						-			
OS = F (Exhib						nibit 13-2)			
Speed Deter	rmination				<u> </u>	terminatio	n		
1 _S = 1.434 (E	xibit 13-11)				, i	ibit 13-12)			
_R = 29.8 mp	h (Exhibit 13-11)				S _R = mph	(Exhibit 13-12)			
	h (Exhibit 13-11)				S ₀ = mph	(Exhibit 13-12)			
	h (Exhibit 13-13)				S = mph	(Exhibit 13-13)			
 at @ 2016 Liniversite	/ of Florida, All Rig	hta Basaniad			HCS2010 TM			Conorat	ed: 5/22/2019

	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	AECOM AM		Highway/Direction of Travel From/To Jurisdiction Analysis Year	I-95 NB Seg 10-I No-Build	Bet 10th St & Hillsbord I 2040
Project Description SW 10th	I STEET SIMR		Des.(N)	Pla	anning Data
Flow Inputs			JC3.(IV)		
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D	7880	veh/h veh/day veh/h	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade % Length Up/Down %	0.95 3 0 Level mi	
Calculate Flow Adjustn	nents				
f _p Ε _T	1.00 1.5		E _R f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	1.2 0.985	
Speed Inputs			Calc Speed Adj and FFS	3	
Lane Width 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) 2806 40.1 70.0 F	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 frout ur volume	-	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11
DDHV - Directional design ho Copyright © 2016 University of Florida			HCS 2010 TM Version 6.90		enerated: 5/22/2019 11:4

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		RAMP	S AND RAM	P JUNCTI	ONS WO	RKS	HEET			
General Info	rmation			Site Infor	mation					
Analyst			Fre	eeway/Dir of Tr	avel	I-95 NE	3			
Agency or Compan	iy AECO	MC		nction		Seg 11	-Off Ramp	Hillsboro EB		
Date Performed				risdiction			1 00 40			
Analysis Time Perio			An	alysis Year		No-Bui	d 2040			
Project Description	SW 10th Stree									
Inputs		FN.	han aft an an Ni	2						
Upstream Adj	Ramp	Freeway Num Ramp Numbe	ber of Lanes, N r of Lanes, N	3 1					Downstrea Ramp	m Adj
✓ Yes	🗹 On		ane Length, L _A						Yes	On
No	Off		ane Length L _D	220					✓ No	Off
L _{up} = 3	3085 ft	Freeway Volu	I	7880					L _{down} =	ft
Lup 0	005 11	Ramp Volume	i v	800					down	-
V _u = 1	660 veh/h	-	-Flow Speed, S _{FF} ow Speed, S _{FR}	70.0 45.0					V _D =	veh/h
Conversion	to pc/h Uni									
							c	c		
(pc/h)	(Veh/hr)	PHF	Terrain	%Truck	%Rv		f _{HV}	f _p	v = V/PHF :	k f _{HV} x f _p
Freeway	7880	0.95	Level	3	0	0.	985	1.00	841	9
Ramp	800	0.92	Level	2	0	0.	990	1.00	87	3
UpStream	1660	0.92	Level	2	0	0.	990	1.00	182	2
DownStream										
		Merge Areas						Diverge Areas		
Estimation o	of v ₁₂				Estimat	ion o	f v ₁₂			
	V ₁₂ = V _F	(P _{EM})					V ₁₂ =	: V _R + (V _F - V _F)P _{FD}	
EQ =	12 1	ation 13-6 or	13-7)		L _{EQ} =			206.25 (Equati		13-13)
P _{FM} =		Equation (E	-		P _{FD} =			509 using Equ		
	•				V ₁₂ =			717 pc/h		
$l_{12} = $	pc/h		4.4.4.4.7					•	- 11	40 47
V_3 or V_{av34}			-14 or 13-17)		V ₃ or V _{av34}			702 pc/h (Equ	ation 13-14	or 13-17
ls V ₃ or V _{av34} > 2,7								Yes No		
Is $V_3^{}$ or $V_{av34}^{}$ > 1.5					Is V ₃ or V _{av}	, ₃₄ > 1.5		🛛 Yes 🗌 No		
f Yes,V _{12a} =	pc/h (13-19)		-16, 13-18, or		If Yes,V _{12a} =	=		719 pc/h (Equ	ation 13-16	13-18,
.20	, , ,	1						r 13-19)		
Capacity Ch					Capacit	y Ch		0.	'1	
	Actual		apacity	LOS F?			Actual		pacity	LOS F
					V _F		8419	Exhibit 13-8		Yes
V _{FO}		Exhibit 13-8			V _{FO} = V _F	- V _R	7541	Exhibit 13-8	7200	Yes
					V _R		878	Exhibit 13-1		No
low Enterin	- <u>-</u>	1			Flow En		-	rge Influen		
	Actual	- r	Desirable	Violation?			Actual	Max Desirab		Violation
		Exhibit 13-8			V ₁₂		717	Exhibit 13-8	4400:All	Yes
V _{R12}						FCAM	ica Da	terminatio	n lif nat E	-)
	vice Detern		if not F)		Level of	Sen		termination		/
		nination (,					.0086 V ₁₂ - 0.		/
D _R = 5.475 + 0	0.00734 v _R + (nination (,				.252 + 0			/
D _R = 5.475 + 0 D _R = (pc/mi/l	0.00734 v _R + (n)	nination (,		D _R = 51	D _R = 4 1.5 (pc	.252 + 0 /mi/ln)			/
Level of Ser $D_R = 5.475 + 0$ $D_R = (pc/mi/l OS = (Exhibit)$	0.00734 v _R + (n) t 13-2)	nination (,		D _R = 51 LOS = F	D _R = 4 1.5 (pc. (Exhit	.252 + 0 /mi/ln) bit 13-2)	.0086 V ₁₂ - 0.		/
$\begin{array}{l} \textbf{Level of Ser}\\ \textbf{D}_{R} = 5.475 + 0\\ \textbf{D}_{R} = (pc/mi/l)\\ \textbf{OS} = (Exhibit)\\ \textbf{Speed Deter} \end{array}$	0.00734 v _R + (In) t 13-2) rmination	nination (,		D _R = 51 LOS = F Speed L	D _R = 4 1.5 (pc. (Exhit Deter	.252 + 0 /mi/ln) bit 13-2) minatic	.0086 V ₁₂ - 0.		,
$D_{R} = 5.475 + (0)_{R} = (pc/mi/l)_{OS} = (Exhibit)_{OS}$	0.00734 v _R + (n) t 13-2) t mination 13-11)	nination (,		D _R = 51 LOS = F Speed L D _s = 0.	D _R = 4 1.5 (pc. (Exhit Deter .377 (E	.252 + 0 /mi/ln) bit 13-2) minatic xhibit 13-	.0086 V ₁₂ - 0. Dn -12)		/
Level of Ser $D_R = 5.475 + (0)_R = (pc/mi/l)_R$ $OS = (Exhibit)_R$ Speed Deter $M_S = (Exibit)_R$	0.00734 v _R + (In) t 13-2) rmination	nination (,		D _R = 51 LOS = F Speed L D _s = 0. S _R = 59	D _R = 4 1.5 (pc. (Exhit Deter .377 (E 9.4 mph	.252 + 0 /mi/ln) bit 13-2) minatic xhibit 13- (Exhibit	.0086 V ₁₂ - 0. DN -12) 13-12)		/
$\frac{\text{Level of Ser}}{D_{R} = 5.475 + 0}$ $D_{R} = (pc/mi/l)$ $OS = (Exhibit)$ $\frac{\text{Speed Deter}}{M_{S}} = (Exibit)$ $\frac{M_{S}}{D_{R}} = mph (Ex)$ $D_{R} = mph (Ex)$	0.00734 v _R + (n) t 13-2) t mination 13-11)	nination (,		D _R = 51 LOS = F Speed L D _s = 0. S _R = 59	D _R = 4 1.5 (pc. (Exhit Deter .377 (E 9.4 mph	.252 + 0 /mi/ln) bit 13-2) minatic xhibit 13-	.0086 V ₁₂ - 0. DN -12) 13-12)		,
evel of Ser $D_R = 5.475 + 0$ $D_R = (pc/mi/l)$ $OS = (Exhibit)$ $OS = (Exhibit)$ $Speed Deter$ $N_S = (Exibit)$ $R^=$ mph (Ex $0^=$ mph (Ex	0.00734 v _R + (In) t 13-2) mination 13-11) khibit 13-11)	nination (,		$D_{R} = 51$ LOS = F Speed L $D_{s} = 0.$ $S_{R} = 59$ $S_{0} = 70$	D _R = 4 1.5 (pc. (Exhit Deter 377 (E 9.4 mph 0.2 mph	.252 + 0 /mi/ln) bit 13-2) minatic xhibit 13- (Exhibit	.0086 V ₁₂ - 0. on -12) 13-12) 13-12)		,

Site Information Highway/Direction of Travel From/To Jurisdiction Analysis Year Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade % Length Up/Down % E_R $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$ Calc Speed Adj and FFS f_{LW} f_{LC}	No-Build Plar 0.95 3 0 Level mi 1.2 0.985	eet Off & On Hillsbord
From/To Jurisdiction Analysis Year (N) Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade % Length Up/Down % E_R $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$ Calc Speed Adj and FFS f_{LW}	Seg 12-B No-Build Plar 0.95 3 0 Level mi 1.2 0.985	2040 nning Data
Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade % Length Up/Down % E_R $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$ Calc Speed Adj and FFS f_{LW}	0.95 3 0 Level mi 1.2 0.985	
Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade % Length Up/Down % E_R $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$ Calc Speed Adj and FFS f_{LW}	0.95 3 0 Level mi 1.2 0.985	
%Trucks and Buses, P_T %RVs, P_R General Terrain: Grade % Length Up/Down % E_R $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$ Calc Speed Adj and FFS f_{LW}	3 0 Level mi 1.2 0.985	mph
f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)] Calc Speed Adj and FFS f _{LW}	0.985	mph
f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)] Calc Speed Adj and FFS f _{LW}	0.985	mph
f _{LW}	8	mph
		mph
TRD Adjustment	70.0	mph mph mph
Design (N)		
<u>Design (N)</u> Design LOS	F	pc/h/ln mph pc/mi/ln
Factor Location		
f _p - Page 11-18		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11
	$v_p = (V \text{ or DDHV}) / (PHF x N x)$ $S = v_p / S$ Required Number of Lanes, N Factor Location $E_R - Exhibits 11-10, 11-12$ $E_T - Exhibits 11-10, 11-11, 11- D_p - Page 11-18$	$v_p = (V \text{ or DDHV}) / (PHF x N x f_{HV} x f_p)$ $S = v_p / S$ Required Number of Lanes, N Factor Location $E_R - Exhibits 11-10, 11-12$ $E_T - Exhibits 11-10, 11-11, 11-13$

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			FREEWA	(WEAV		_				
Genera	al Informati	on			Site Information					
Analyst Agency/Co Date Perfo Analysis T		AECO AM	М		Freeway/Dir Weaving Seg Analysis Yea	gment Locati		IB 3-Bet On & C ıild 2040)ff Hillsboro	
Project De Inputs	scription SW 10t	h Street SIM	۲							
Weaving n Weaving s Freeway fr	onfiguration umber of lanes, N egment length, L ree-flow speed, F	s FS	r Base Co	One-Sided 4 790ft 70 mph	Segment typ Freeway min Freeway ma: Terrain type	Freewa 24(Lev				
CONVE	V (veh/h)	PHF	Truck (%)	RV (%)	E _T	E _R	f _{HV}	fp	v (pc/h)	
V _{FF}	6430	0.95	3	0	1.5	1.2	0.985	1.00	6870	
V _{RF}	660	0.92	2	0	1.5	1.2	0.990	1.00	725	
V _{FR}	650	0.92	2	0	1.5	1.2	0.990	1.00	714	
V _{RR}	0	0.95	2	0	1.5	1.2	0.990	1.00	0	
V _{NW}	6870							V =	8309	
V _W	1439									
VR	0.173									
Config	uration Cha	aracteris	tics							
Minimum ı	maneuver lanes,	N _{WL}		2 lc	Minimum we	aving lane c	hanges, LC _{MIN}		1439 lc	
Interchang	ge density, ID			0.7 int/mi	Weaving lan	1650 lc				
Minimum I	RF lane changes	, LC _{rf}		1 lc/pc	Non-weaving	g lane chang	es, LC _{NW}		1073 lc	
Minimum I	FR lane changes	, LC _{FR}		1 lc/pc	Total lane ch	nanges, LC _{AL}	L		2723 lc	
Minimum I	RR lane changes	, LC _{RR}		lc/pc	Non-weaving	g vehicle inde	ex, I _{NW}		38	
Weavir	ng Segmen	t Speed,	Density,	Level of	Service,	and Cap	pacity			
Weaving s	segment flow rate	e, V		8193 veh/h	Weaving inte				0.60	
Weaving s	segment capacity	, c _w		8410 veh/h	Weaving seg				49.6 mp	
Weaving s	segment v/c ratio			0.974	Average wea	• •	**		49.4 mp	
-	segment density,	D	4	1.9 pc/mi/ln	Average nor	n-weaving sp	eed, $S_{_{NW}}$		49.7 mp	
Level of S	ervice, LOS			E	Maximum weaving length, L _{MAX} 4264					
Notes										

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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ite Information ighway/Direction of Travel rom/To urisdiction halysis Year .(N) eak-Hour Factor, PHF Trucks and Buses, P _T RVs, P _R eneral Terrain: rade % Length Up/Down %	No-Build 20	t Off & On Hillsbord
irisdiction nalysis Year .(N) eak-Hour Factor, PHF Trucks and Buses, P _T RVs, P _R eneral Terrain: rade % Length Up/Down %	Seg 14-Bet No-Build 20 Plann 0.95 3 0 Level mi	040
eak-Hour Factor, PHF Trucks and Buses, P _T RVs, P _R eneral Terrain: rade % Length Up/Down %	0.95 3 O Level mi	ing Data
eak-Hour Factor, PHF Trucks and Buses, P _T RVs, P _R eneral Terrain: rade % Length Up/Down %	0.95 3 O Level mi	
Trucks and Buses, P _T RVs, P _R eneral Terrain: rade % Length Up/Down %	3 0 Level mi	
	1.2	
	1.2	
יייייייייייייייייייייייייייייייייייייי	0.985	
alc Speed Adj and FFS		
.w ₋c RD Adjustment ïFS	70.0	mph mph mph mph
esign (N)		
<u>esign (N)</u> esign LOS	- _{HV} x f _p)	pc/h/ln mph pc/mi/ln
actor Location		
- Page 11-18	I3 f _l T	_{LW} - Exhibit 11-8 _{LC} - Exhibit 11-9 「RD - Page 11-11
e e	= (V or DDHV) / (PHF x N x f equired Number of Lanes, N actor Location R_2 - Exhibits 11-10, 11-12 - Exhibits 11-10, 11-11, 11-1 - Page 11-18	= (V or DDHV) / (PHF x N x $f_{HV} x f_p$) = v_p / S equired Number of Lanes, N actor Location R - Exhibits 11-10, 11-12 f - Exhibits 11-10, 11-11, 11-13 f

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_			REEWA	(WEAV		_	Γ			
Genera	al Informati	on			Site Information					
-	ime Period	AECO AM			Freeway/Dir Weaving Seg Analysis Yea	gment Locati		IB 5-Bet On & C ıild 2040	Off to Exp	
Project De Inputs	scription SW 10t	h Street SIM	2							
Weaving n Weaving s Freeway fr	configuration number of lanes, N egment length, L ree-flow speed, F	s FS	r Baso Co	Two-Sided 3 4665ft 70 mph	Segment typ Freeway min Freeway ma: Terrain type	Freew 24 Lev				
Conve	V (veh/h)	PHF	Truck (%)	RV (%)	E _T	E _R	f _{HV}	fp	v (pc/h)	
V _{FF}	5525	0.95	3	0	1.5	1.2	0.985	1.00	5903	
V _{RF}	635	0.92	2	0	1.5	1.2	0.990	1.00	697	
V _{FR}	1565	0.92	2	0	1.5	1.2	0.990	1.00	1718	
V _{RR}	175	0.92	2	0	1.5	1.2	0.990	1.00	192	
V _{NW}	8318							V =	8510	
V _W	192									
VR	0.023									
Config	uration Cha	aracteris	tics							
	maneuver lanes,			0 lc	Minimum we	aving lane c	hanges, LC _{MIN}		lc	
Interchang	ge density, ID			0.7 int/mi	Weaving lan	lc				
Minimum I	RF lane changes,	LC _{RF}		0 lc/pc	Non-weaving	g lane chang	es, LC _{NW}		lc	
Minimum I	FR lane changes,	LC _{FR}		0 lc/pc	Total lane ch	nanges, LC _{AL}	L		lc	
Minimum I	RR lane changes	, LC _{RR}		3 lc/pc	Non-weaving	g vehicle inde	ex, I _{NW}			
Weavir	ng Segmen ⁻	t Speed,	Density,	Level of	Service,	and Cap	oacity			
•	segment flow rate segment capacity			8398 veh/h 6807 veh/h	Weaving inte Weaving seg	•			mp	
	segment v/c ratio	w		1.234	Average wea	aving speed,	S _w		mp	
Weaving s	segment density,	D		pc/mi/ln	Average nor	n-weaving sp	eed, S _{NW}		mp	
Level of S	ervice, LOS			F	Maximum weaving length, L _{MAX} 593					
Notes										

Chapter 13, "Freeway Merge and Diverge Segments". b. For volumes that exceed the weaving segment capacity, the level of service is "F".

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	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	AECOM AM		Highway/Direction of Travel From/To Jurisdiction Analysis Year	l-95 NB Seg 16- No-Build	North of Hillsboro 1 2040
Project Description SW 10th	h STreet SIMR				naine Data
✓ Oper.(LOS) Flow Inputs			Des.(N)	Pla	anning Data
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D	6160	veh/h veh/day veh/h	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade % Length Up/Down %	0.95 4 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 0.980	
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) 2205 58.3 37.8 E	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		
	S - Speed D - Density FFS - Free-flow BFFS - Base fro	-	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11
LOS - Level of service DDHV - Directional design ho	BFFS - Base fro ur volume	-	۴		TRD - Page 1

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			REEWA	r weav		-	Γ				
Genera	al Informati	on			Site Information						
Analyst Agency/Co Date Perfo Analysis T		AECO PM	М		Freeway/Dir Weaving Seg Analysis Yea	gment Locati		IB -Bet Copans ıild 2040	& Sample		
Project De Inputs	escription SW 10t	th Street SIM	२								
Weaving r Weaving s Freeway f	configuration number of lanes, I segment length, L ree-flow speed, F	s FS		One-Sided 4 1820ft 70 mph	Segment typ Freeway min Freeway max Terrain type		Freewa 24(Lev				
Conve	rsions to p	1	1	1	1						
	V (veh/h)	PHF	Truck (%)	RV (%)	E _T	E _R	f _{HV}	fp	v (pc/h)		
V _{FF}	4770	0.95	3	0	1.5	1.2	0.985	1.00	5096		
V _{RF}	480	0.92	2	0	1.5	1.2	0.990	1.00	527		
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}	5096							V =	7610		
V _W	2514										
VR	0.330										
	juration Cha		tics		I						
Minimum	maneuver lanes,	N _{WL}		2 lc			hanges, LC _{MIN}		lc		
	ge density, ID			0.7 int/mi	Weaving lane changes, LC _w						
	RF lane changes	ru -			Non-weaving				lc		
Minimum	FR lane changes	, LC _{FR}		1 lc/pc	Total lane ch	nanges, LC_{AL}	L		lc		
Minimum	RR lane changes	, LC _{RR}		lc/pc	Non-weaving	g vehicle inde	ex, I _{NW}				
Weavii	ng Segmen	t Speed,	Density,	Level of	Service,	and Cap	oacity				
•	segment flow rate			7511 veh/h	Weaving inte						
	segment capacity	, c _w		7158 veh/h	Weaving seg				mp		
•	segment v/c ratio	_		1.049	Average wea				mp		
-	segment density,	U		pc/mi/ln	Average nor				mp		
	Service, LOS			F	Maximum we	eaving length	n, L _{MAX}		5912		
Notes	segments longer t	han the calcul	ated maximum l	enath should l	ne treated as is	solated merce	and diverge an	eas using the	procedures of		
Chapter 13	, "Freeway Merge	and Diverge Se	egments".	C		orateu merge	and diverge an	eas using the			
	mes that exceed the ersity of Florida All	0 0						Can	erated: 5/22/2		

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	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company	AECOM		Highway/Direction of Travel From/To	l-95 NB Seg 2-Bei Sample	t Off & On from
Date Performed Analysis Time Period	PM		Jurisdiction Analysis Year	No-Build 2	2040
Project Description SW 10th	n Street SIMR				
Oper.(LOS)			Des.(N)	Plan	ning Data
Flow Inputs					
/olume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D	5250	veh/h veh/day veh/h	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade % Length Up/Down %	0.95 3 0 Level mi	
	4 .				
Calculate Flow Adjustn					
f _p	1.00		E _R	1.2	
E _T	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
Speed Inputs			Calc Speed Adj and FFS	5	
₋ane 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			
OS and Performance	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) 1870 64.8 28.9 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 fre	-	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-	-13	f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11
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		RAI		RAMP JUN	CTIONS W	ORKSHE	ET				
Genera	I Infor	mation			Site Infor	mation					
nalyst				Fr	eeway/Dir of Tr	avel I	-95 N	B			
gency or (AECO	MC	Ju	nction	S	Seg 3	-On Ramp f	rom Sample		
ate Perfor					risdiction						
nalysis Ti				Ar	nalysis Year	1	No-Bu	uild 2040			
roject Des nputs	scription	SW 10th Stree	t SIMR								
			Freeway Num	ber of Lanes, N	3					1	
Jpstream A	Adj Ramp		-							Downstre	eam Adj
Yes	🗌 On		Ramp Numbe		1					Ramp	
				ane Length, L _A	500					🗹 Yes	🗹 On
✓ No	🗌 Off	:		Lane Length L _D						🗌 No	Off
_			Freeway Volu		5250					. –	
up =	ft		Ramp Volume	IX .	1150					L _{down} =	1950 ft
/ _u =	veh/h		Freeway Free	-Flow Speed, S _{FF}	70.0					V _D =	770 veh/h
u	VOINI		Ramp Free-F	ow Speed, S _{FR}	50.0					D	
conver	rsion to	o pc/h Und	der Base	Conditions							
(pc/	/h)	V (Voh/br)	PHF	Terrain	%Truck	%Rv		f _{HV}	f _p	v = V/PH	F x f _{HV} x f _p
-reeway		(Veh/hr) 5250	0.95	Level	3	0	0).985	1.00		5609
Ramp		1150	0.95	Level	2	0).985	1.00		1262
JpStream		1100	0.52	Lovei			+	7.000	1.00		1202
DownStrea	am	770	0.92	Level	2	0	0).990	1.00		845
			Merge Areas						iverge Areas	•	
stima	tion of	v ₁₂				Estimati	on d	of v ₁₂			
		V ₁₂ = V _F	(P _{EM})					V - V			
eq =		.= .	ation 13-6 o	r 13-7)		_			V _R + (V _F - V _R		40)
, FM =				tion (Exhibit 13-6)		L _{EQ} =			Equation 13-		-
/ ₁₂ =		3318				P _{FD} =			using Equatio	on (Exhibit i	13-7)
				on 13-14 or 13-		V ₁₂ =			oc/h		
V_3 or V_{av34}		17)				V ₃ or V _{av34}			oc/h (Equation 1		·17)
s V_3 or V_a	_{v34} > 2,70	0 pc/h? 🗌 Ye	s 🗹 No			Is V_3 or $V_{av34} > 2,700 \text{ pc/h}$? Yes No Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ Yes No					
s V_3 or V_a	_{v34} > 1.5 *	V ₁₂ /2 Ve	s 🗌 No			Is V ₃ or V _{av34}	₄ > 1.9	5 * V ₁₂ /2	∐Yes ∐No	. 10 10	10.10
Yes,V _{12a}	=			on 13-16, 13-		If Yes,V _{12a} =			oc/h (Equatio 3-19)	n 13-16, 1	13-18, 01
.20		18, or	13-19)			Concoit	. Ch				
Japaci	ty Che	Actual		Capacity	LOS F?	Capacity		r	Ca	pacity	LOS F?
		Actual		apacity	LUGF?	V _F		Actual	Exhibit 13-	1	LUGF?
						· · ·	$\overline{\mathbf{v}}$			_	_
V _F	0	6871	Exhibit 13-8		No	$V_{FO} = V_{F}$	- v _R		Exhibit 13-		_
						V _R			Exhibit 13 10	-	
low E	nterind	n Merge In	fluence A	rea	•	Flow Ent	terir	na Dive	ge Influer	ice Area	<u>'</u>
		Actual		Desirable	Violation?			Actual	Max Des		Violation?
V _R	12	4580	Exhibit 13-8	4600:All	No	V ₁₂			Exhibit 13-8		
.evel o	f Servi	ice Detern	nination (if not F)		Level of	Ser	vice De	terminatio	n (if no	t F)
D _R :	= 5.475 +	0.00734 v _R + ().0078 V ₁₂ - 0.	00627 L _A		C) _R = .	4.252 + 0	.0086 V ₁₂ - 0	.009 L _D	*
	37.5 (pc/mi		12				c/mi/		12	D	
	E (Exhibit 1							it 13-2)			
		nination				Speed D			n		
								13-12)	<u>, , , , , , , , , , , , , , , , , , , </u>		
•).651 (Exit										
		Exhibit 13-11)					•	(hibit 13-12)			
0	• •	Exhibit 13-11)				, v		(hibit 13-12)			
		Exhibit 13-13)						hibit 13-13)			
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Conoral Information			Sita Information		
General Information			Site Information		
Analyst	450014		Highway/Direction of Travel From/To	I-95 NB Seg 4-Be	et On from Sample &
Agency or Company	AECOM			Exp	
Date Performed Analysis Time Period	PM		Jurisdiction Analysis Year	No-Build	2040
Project Description SW 10th	n Street SIMR				
Oper.(LOS)			Des.(N)	Pla	nning Data
Flow Inputs					
Volume, V	6400	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			General Terrain:	Level	
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	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		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)		
<u> Operational (LOS)</u>			Design LOS		
v _p = (V or DDHV) / (PHF x N x	(f _{HV} x f _p) 2279	pc/h/ln	$v_p = (V \text{ or DDHV}) / (PHF x N x)$	f.,, x f.)	pc/h/ln
S	56.5	mph	S	пv р⁄	mph
$D = v_p / S$	40.3	pc/mi/ln	$D = v_n / S$		pc/mi/ln
LOS	E		Required Number of Lanes, N		portium
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 - Houny volume	FFS - Free-flow	sneed	E _T - Exhibits 11-10, 11-11, 11-	13	f _{LC} - Exhibit 11-9
P		-	f _p - Page 11-18		TRD - Page 11-11
LOS - Level of service	BFFS - Base fre	ee-now speed	LOS, S, FFS, v _p - Exhibits 11-	2 11 2	

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		RAI	MPS AND	RAMP JUN		ORKSHE	ET				
Genera	l Infor	nation			Site Infor	mation					
Analyst				Fr	eeway/Dir of Tr	avel I.	-95 NE	3			
Agency or (AECO	MC		nction	S	Seg 5-	On from Ex	р		
Date Perfor					risdiction						
Analysis Tir		PM SW 10th Stree		Ar	alysis Year	N	No-Bui	ld 2040			
nputs	scription	SW 10th Stree	I SIIVIR								
			Freeway Num	ber of Lanes, N	3						
Jpstream A	Adj Ramp		Ramp Numbe		1					Downstre Ramp	eam Adj
Yes	🗌 On				•					-	
				ane Length, L _A	600					🗹 Yes	On
✓ No	🗌 Off			_ane Length L _D						🗌 No	✓ Off
_	<u>н</u>		Freeway Volu	1	6400					. =	5545 ft
-up =	ft		Ramp Volume	i v	770					L _{down} =	5545 IL
/ _u =	veh/h		-	-Flow Speed, S _{FF}	70.0					V _D =	1590 veh/h
u	Veniin		Ramp Free-Fl	ow Speed, S _{FR}	50.0					U	
Conver	rsion to	o pc/h Und	der Base	Conditions							
(pc/	/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv		f _{HV}	f _p	v = V/PH	IF x f _{HV} x f _p
Freeway	,	6400	0.95	Level	3	0		985	1.00		6838
Ramp		770	0.93	Level	2	0		990 990	1.00		845
UpStream		110	0.52	20001	2	0	<u> </u>	000	1.00		0+0
DownStrea	am	1590	0.92	Level	2	0	0.	990	1.00		1746
			Merge Areas		<u>L</u>				iverge Areas		
Estima	tion of	V ₁₂				Estimatio	on o	f v ₁₂			
		V ₁₂ = V _F	(P _{EM})					<u> </u>			
- _{EQ} =				n 13-6 or 13-7)		_			V _R + (V _F - V _R		10)
P _{FM} =				ion (Exhibit 13-6)		L _{EQ} =			Equation 13-		-
/ ₁₂ =		4318 g				P _{FD} =			using Equatio	n (Exhibit	13-7)
				on 13-14 or 13-		V ₁₂ =		•	oc/h		
V_3 or V_{av34}		17)				V_3 or V_{av34}			oc/h (Equation 1	3-14 or 13-	-17)
Is V_3 or V_a	_{v34} > 2,700) pc/h? 🗌 Yes	s 🗹 No						Yes No		
Is $V_3^{}$ or $V_a^{}$	_{v34} > 1.5 *	V ₁₂ /2 Ves	s 🗌 No			Is V ₃ or V _{av34}	₄ > 1.5		Yes No	10.10	
f Yes,V _{12a}		4318 p	oc/h (Equati	on 13-16, 13-		If Yes,V _{12a} =			oc/h (Equation 3-19)	n 13-16, ′	13-18, or
		18, or	13-19)			Conceitu	- C h		,		
Capaci	ly Che			`anasitu	LOS F?	Capacity			Car	pacity	LOS F?
		Actual		apacity	LUGF?	V _F		Actual	Exhibit 13-8		LUGF?
							$\overline{\mathbf{v}}$			_	
V _F	o	7683	Exhibit 13-8		Yes	V _{FO} = V _F -	- v _R		Exhibit 13-8		
						V _R			Exhibit 13- 10	-	
-low E	nterino	Merge In	fluence A	rea		Flow Ent	terin	a Diver	ge Influen	ce Area	 a
		Actual	1	Desirable	Violation?		1	Actual	Max Desi		- Violation?
V _R	12	5681	Exhibit 13-8	4600:All	Yes	V ₁₂			Exhibit 13-8		
		ce Detern	nination (if not F)			Ser	vice De	terminatio	n (if no	t F)
		0.00734 v _R + 0		,					0086 V ₁₂ - 0.		/
	5.6 (pc/mi		12	A			c/mi/li		12	U	
	Exhibit 1	,						13-2)			
		nination				Speed D			n		
									11		
°	.405 (Exib					, , , , , , , , , , , , , , , , , , ,	hibit 1				
		Exhibit 13-11)						nibit 13-12)			
0	• •	Exhibit 13-11)				, i i i i i i i i i i i i i i i i i i i		nibit 13-12)			
		Exhibit 13-13)						nibit 13-13)			
t © 2016 L	Iniversity of	Florida, All Righ	nts Reserved			HCS2010 TM	Voroi	on 6 00		Generat	ed: 5/22/2019

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Site InformationHighway/Direction of Travel From/To Jurisdiction Analysis YearDes.(N)Peak-Hour Factor, PHF $\%$ Trucks and Buses, P T %RVs, P R General Terrain: Grade % Length Up/Down %E R f HV = 1/[1+P T(E T - 1) + P R(E R - 1)]	No-Build 2	Exp On & Off to 10t
From/To Jurisdiction Analysis Year Des.(N) Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade % Length Up/Down % E_R $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	Seg 6-Bet No-Build 2 Plant 0.95 3 0 Level mi	2040
Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade % Length Up/Down % E_R $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.95 3 0 Level mi 1.2	ning Data
Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade % Length Up/Down % E_R $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.95 3 0 Level mi 1.2	ning Data
%Trucks and Buses, P_T %RVs, P_R General Terrain: Grade % Length Up/Down % E_R $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	3 O Level mi 1.2	
%Trucks and Buses, P_T %RVs, P_R General Terrain: Grade % Length Up/Down % E_R $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	3 O Level mi 1.2	
General Terrain: Grade % Length Up/Down % E_R $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	Level mi 1.2	
$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$		
$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$		
	0.985	
Calc Speed Adj and FFS	6	
f _{LW}		mph
f _{LC}		mph
i TRD Adjustment		mph
FFS	70.0	mph
Design (N)		
<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	··· P	pc/h/ln mph pc/mi/ln
Factor Location		
f _p - Page 11-18	-13	f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11
	f_{LW} f_{LC} $TRD Adjustment$ FFS $Design (N)$ $Design (N)$ $Design LOS$ $v_{p} = (V \text{ or DDHV}) / (PHF x N x)$ S $D = v_{p} / S$ $Required Number of Lanes, N$ $Factor Location$ $E_{R} - Exhibits 11-10, 11-12$ $E_{T} - Exhibits 11-10, 11-11, 11-12$ $E_{T} - Page 11-18$ $LOS, S, FFS, v_{p} - Exhibits 11-12$	f_Lw f_{LW} f_{LC} TRD AdjustmentFFS70.0Design (N)Design LOS $v_p = (V \text{ or DDHV}) / (PHF x N x f_{HV} x f_p)$ S $D = v_p / S$ Required Number of Lanes, NFactor Location $E_R - Exhibits 11-10, 11-12$ $E_T - Exhibits 11-10, 11-11, 11-13$

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		RAMP	S AND RAM	P JUNCTI	ONS WC	ORKS	HEET			
General Info	rmation			Site Infor	mation					
Analyst			Fr	eeway/Dir of Tr	avel	I-95 NE	3			
Agency or Compan	y AEC	OM		inction		Seg 7-	Off Ramp t	o 10th St		
Date Performed				risdiction		N 5 '				
Analysis Time Peric			Ar	nalysis Year		No-Bui	ld 2040			
Project Description	Svv Tuth Stree	I SIVIIR								
Inputs			hara fila ana Ni							
Upstream Adj I	Ramp	Freeway Num Ramp Numbe	ber of Lanes, N r of Lanes, N	3 1					Downstrea Ramp	m Adj
Yes	On		ane Length, L _A	·					✓ Yes	🗹 On
✓ No	Off	Deceleration L	ane Length L _D	250					□ No	
		Freeway Volu	1	7170						130 ft
L _{up} =	ft	Ramp Volume	IX	1590					L _{down} =	130 11
V,, =	veh/h	Freeway Free	-Flow Speed, S _{FF}	70.0					V _D =	1320 veh
v _u –	Ven/m	Ramp Free-Fl	ow Speed, S _{FR}	45.0					D	1020 1011
Conversion	to pc/h Une	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	7170	0.95	Level	3	0	0.	985	1.00	766	61
Ramp	1590	0.92	Level	2	0	_	990	1.00	174	
UpStream										
DownStream	1320	0.92	Level	2	0	0.	990	1.00	144	49
		Merge Areas						Diverge Areas		
Estimation o	of v ₁₂				Estimat	tion o	f v ₁₂			
	V ₁₂ = V _F	(P _{EM})					V ₁₂ =	: V _R + (V _F - V _F)P _{ED}	
=	12 1	tion 13-6 or	13-7)		L _{EQ} =			Equation 13-1		
- _{EQ} = P =		Equation (E	-		$P_{FD} =$			488 using Equ		
P _{FM} =	e e				V ₁₂ =			533 pc/h		JIC 10-7)
$/_{12} =$	pc/h	40	4.4.4.4.7					•		40 47
V_3 or V_{av34}			-14 or 13-17)		V_3 or V_{av34}	. 0 7)28 pc/h (Equ	ation 13-14	or 13-17
Is V_3 or $V_{av34} > 2,7$								Yes No		
Is V ₃ or V _{av34} > 1.5			10 10 10		Is V ₃ or V _{av}	_{/34} > 1.5		Yes Vo		
f Yes,V _{12a} =	pc/h (13-19)		-16, 13-18, or		If Yes,V _{12a} :	=		961 pc/h (Equ r 13-19)	ation 13-16	, 13-18,
Capacity Ch	,	1			Capacit	ty Ch		13-19)		
Supacity on	Actual		apacity	LOS F?		y on	Actual	Ca	pacity	LOS F
	Actual	i ĭ	apaony		V _F		7661	Exhibit 13-8	<u>'</u>	Yes
									_	
V		Exhibit 13-8			$V_{FO} = V_{F}$	= - v _R	5915	Exhibit 13-8		No
V_{FO}										
					V _R		1746	Exhibit 13-1		No
						nterin	g Dive	rge Influen	ce Area	_
-low Enterin	ng Merge In Actual	Max	rea Desirable	Violation?	Flow Er	nterin	g Dive Actual	rge Influen Max Desirab	ce Area	No Violation
Flow Enterin V _{R12}	Actual	Max Exhibit 13-8	Desirable	Violation?	Flow Er	nterin	g Dive Actual 4633	rge Influen Max Desirab Exhibit 13-8	ce Area ble 4400:All	Violation' Yes
Flow Enterin V _{R12}	Actual	Max Exhibit 13-8	Desirable	Violation?	Flow Er	nterin	g Dive Actual 4633	rge Influen Max Desirab	ce Area ble 4400:All	Violation Yes
Flow Enterin V _{R12}	Actual	Max Exhibit 13-8	Desirable if not F)	Violation?	Flow Er V ₁₂ Level o	nterin / / f Serv	g Dive Actual 4633 /ice De	rge Influen Max Desirab Exhibit 13-8	ce Area ble 4400:All n (if not F	Violation Yes
Flow Enterin V _{R12} Level of Serv D _R = 5.475 + 0	Actual vice Detern 0.00734 v _R +	Max Exhibit 13-8	Desirable if not F)	Violation?	Flow Er V ₁₂ Level o	nterin / / f Serv	g Dive Actual 1633 /ice De 1.252 + 0	rge Influen Max Desirab Exhibit 13-8 termination	ce Area ble 4400:All n (if not F	Violation Yes
Flow Enterin V _{R12} Level of Serv D _R = 5.475 + 0 D _R = (pc/mi/l	Actual vice Detern 0.00734 v _R + n)	Max Exhibit 13-8	Desirable if not F)	Violation?	Flow Er V ₁₂ Level o D _R = 4	nterin 7 f Serv D _R = 4 4.7 (pc.	g Dive Actual 4633 /ice De 1.252 + 0 /mi/ln)	rge Influen Max Desirab Exhibit 13-8 termination	ce Area ble 4400:All n (if not F	Violation Yes
V _{R12} Level of Ser D _R = 5.475 + 0 D _R = (pc/mi/li OS = (Exhibit	Actual vice Detern 0.00734 v _R + n) t 13-2)	Max Exhibit 13-8	Desirable if not F)	Violation?	Flow Er V ₁₂ Level o D _R = 4 LOS = F	<i>iterin</i> <i>f</i> Serv D _R = 4 4.7 (pc.	g Dive Actual 1633 /ice De 1.252 + 0 /mi/ln) bit 13-2)	rge Influen Max Desirab Exhibit 13-8 termination .0086 V ₁₂ - 0.	ce Area ble 4400:All n (if not F	Violation Yes
Flow Enterin V_{R12} Level of Server $D_R = 5.475 + 0$ $D_R = (pc/mi/line)$ LOS = (Exhibit) Speed Deterver	Actual vice Detern 0.00734 v _R + n) 13-2) mination	Max Exhibit 13-8	Desirable if not F)	Violation?	Flow Er V_{12} Level of $D_R = 4$ LOS = F Speed I	nterin f Serv D _R = 4 4.7 (pc. (Exhit	g Dive Actual 4633 /ice De 4.252 + 0 /mi/ln) bit 13-2) minatic	rge Influen Max Desirab Exhibit 13-8 termination .0086 V ₁₂ - 0.	ce Area ble 4400:All n (if not F	Violation Yes
Flow Enterin V_{R12} Level of Server $D_R = 5.475 + 0$ $D_R = (pc/mi/lit)$ OS = (Exhibit) Speed Deterver $M_S = (Exibit)$	Actual vice Detern 0.00734 v _R + n) 13-2) mination 13-11)	Max Exhibit 13-8	Desirable if not F)	Violation?	Flow Er V_{12} Level of $D_R = 4$ LOS = F Speed I $D_s = 0$	nterin f Serv D _R = 4 4.7 (pc. (Exhite Deter .455 (E	g Dive Actual 1633 /ice De 1.252 + 0 /mi/ln) bit 13-2) minatic xhibit 13-	rge Influen Max Desirab Exhibit 13-8 termination .0086 V ₁₂ - 0.	ce Area ble 4400:All n (if not F	Violation Yes
Flow Enterin V_{R12} Level of Server $D_R = 5.475 + 0$ $D_R = (pc/mi/le OS = (Exhibit Speed Deterver M_S = (Exibit = 1)S_R = mph (Existent = 1)$	Actual vice Detern 0.00734 v _R + n) 13-2) mination 13-11) thibit 13-11)	Max Exhibit 13-8	Desirable if not F)	Violation?	Flow Er V_{12} Level of $D_R = 4$ LOS = F Speed I $D_s = 0$ $S_R = 5$	f Serv D _R = 4 4.7 (pc (Exhit Deter .455 (E 7.3 mph	g Dive Actual 4633 /ice De 1.252 + 0 /mi/ln) bit 13-2) minatic xhibit 13- (Exhibit	rge Influen Max Desirab Exhibit 13-8 termination .0086 V ₁₂ - 0. 000 -12) 13-12)	ce Area ble 4400:All n (if not F	Violation' Yes
Flow Enterin V_{R12} Level of Server $D_R = 5.475 + 0$ $D_R = (pc/mi/lit)$ OS = (Exhibit) Speed Deterver $M_S = (Exibit)$ $G_R = mph (Exhibit)$ $G_R = mph (Exhibit)$	Actual vice Detern 0.00734 v _R + n) t 13-2) mination 13-11)	Max Exhibit 13-8	Desirable if not F)	Violation?	Flow Er V_{12} Level or $D_R = 4$ LOS = F Speed I $D_s = 0$ $S_R = 5$ $S_0 = 7$	terin f Serv D _R = 4 4.7 (pc. (Exhite Deter .455 (E 7.3 mph 0.2 mph	g Dive Actual 1633 /ice De 1.252 + 0 /mi/ln) bit 13-2) minatic xhibit 13-	rge Influen Max Desirat Exhibit 13-8 termination .0086 V ₁₂ - 0. 000 -12) 13-12) 13-12)	ce Area ble 4400:All n (if not F	Violation Yes

			-		
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	AECOM PM		Highway/Direction of Travel From/To Jurisdiction Analysis Year	I-95 NB Seg 8-Be No-Build	et Off & On 10th St ' 2040
Project Description SW 10t	h Street SIMR				
🗹 Oper.(LOS)			Des.(N)	🗌 Pla	nning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D	5580	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain:	0.95 3 0 Level	
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	mi	
Calculate Flow Adjustr	nents				
f _p	1.00		E _R	1.2	
E _T	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
Speed Inputs			Calc Speed Adj and FFS	\$	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f _{LW}		mph
Number of Lanes, N	3		f _{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			
LOS and Performance	Measures		Design (N)		
<u>Operational (LOS)</u> v _p = (V or DDHV) / (PHF x N) S D = v _p / S LOS	x f _{HV} x f _p) 1987 62.8 31.6 D	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	-	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-17

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		RA	MPS AND	RAMP JUN	CTIONS W	ORKSHE	ET				
General	Inform	nation			Site Infor	mation					
Analyst				Fre	eeway/Dir of Tr	avel I-9	95 NB				
gency or Co	ompany	AEC	MC	Ju	nction	Se	eg 9-On Ramp	10th St EB & WB			
ate Perform					risdiction						
nalysis Time		PM		An	alysis Year	No	p-Build 2040				
	ription	SW 10th Stree	t SIMR								
nputs			L								
Jpstream Ad	j Ramp		-	per of Lanes, N	3				Downstre	am Adj	
			Ramp Number	of Lanes, N	1				Ramp		
✓ Yes	On		Acceleration L	ane Length, L _A	1345				🗌 Yes	On	
No	✓ Off		Deceleration L	ane Length L _D							
			Freeway Volur	ne, V _F	5580				🗹 No	Off	
up =	1370 f	t	Ramp Volume	, V _D	1320				L _{down} =	ft	
				Flow Speed, S _{FF}	70.0						
'u =	1590 ve	eh/h	Ramp Free-Flo		50.0				V _D =	veh/h	
<u>`onvoro</u>	ion to	no/h lln		Conditions	50.0						
		v	1 I			<u>г г</u>					
(pc/h))	(Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PH	F x f _{HV} x f _p	
reeway		5580	0.95	Level	3	0	0.985	1.00		5962	
Ramp		1320	0.92	Level	2	0	0.990	1.00		1449	
JpStream		1590	0.92	Level	2	0	0.990	1.00		1746	
DownStream	1										
			Merge Areas					Diverge Areas			
stimati	on of	V ₁₂				Estimatio	n of v ₁₂				
		V ₁₂ = V _F	(P _{EM})								
=		12 1		13-6 or 13-7)			.=	$V_R + (V_F - V_R)$			
EQ =				-		L _{EQ} =		(Equation 13-	12 or 13-'	13)	
FM =				on (Exhibit 13-6)		P _{FD} =		using Equatio	n (Exhibit 1	3-7)	
12 =		3281				V ₁₂ =		pc/h			
$_3$ or V $_{\rm av34}$		2681 17)	pc/n (Equation	on 13-14 or 13-		$V_3^{}$ or $V_{av34}^{}$		pc/h (Equation 1	3-14 or 13-	17)	
s V ₂ or V ₂	. > 2.700) pc/h? 🗌 Ye	s 🗸 No			Is V_3 or V_{av34}	> 2,700 pc/h? [Yes No			
		V ₁₂ /2						Yes 🗌 No			
				on 13-16, 13-		If Yes,V _{12a} =		pc/h (Equation	า 13-16, 1	3-18, or	
Yes,V _{12a} =			13-19)	JI 13-10, 13-		11 1 es, v _{12a} -	1	3-19)			
Capacity	/ Chec		/			Capacity	Checks				
		Actual	C	apacity	LOS F?	Actual Capacity I					
						V _F		Exhibit 13-8	3		
V		7444			Vee	$V_{FO} = V_F - V_F$	V	Exhibit 13-8	3		
V_{FO}		7411	Exhibit 13-8		Yes		⁻ R	Exhibit 13-			
						V _R		10			
low En	tering	Merge In	fluence A	rea		Flow Ente	ering Dive	rge Influen	ce Area	1	
	Ť	Actual		Desirable	Violation?		Actual	Max Desi		Violation?	
V _{R12}		4855	Exhibit 13-8	4600:All	Yes	V ₁₂		Exhibit 13-8			
		ce Detern	nination (i	f not F)		Level of S	Service De	terminatio	n (if not	t F)	
).0078 V ₁₂ - 0.0	,		1).0086 V ₁₂ - 0.	•	,	
	.2 (pc/mi/		12	A			/mi/ln)	12 01	U		
		,					-				
	Exhibit 1						hibit 13-2)				
Speed D	eterm	ination				Speed De		on			
l _s = 0.6	87 (Exib	it 13-11)				, i	iibit 13-12)				
_R = 50.	.8 mph (E	Exhibit 13-11)				S _R = mph	(Exhibit 13-12)				
							S ₀ = mph (Exhibit 13-12)				
		Exhibit 13-13)				S = mph	(Exhibit 13-13)				
	iversity of	Florida, All Rig	hta Baganyad			HCS2010 TM			Conorat	ed: 5/22/2019	

	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	AECOM PM		Highway/Direction of Travel From/To Jurisdiction Analysis Year	I-95 NB Seg 10-I No-Build	Bet 10th St & Hillsbord I 2040
Project Description SW 10th	Street SIMR		Des.(N)		Inning Data
Flow Inputs			Des.(IV)		
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D	6900	veh/h veh/day veh/h	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade % Length Up/Down %	0.95 3 0 Level mi	
Calculate Flow Adjustm	nents				
f _p Ε _T	1.00 1.5		E _R f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	1.2 0.985	
Speed Inputs			Calc Speed Adj and FFS	3	
Lane Width 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 I	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) 2457 51.7 47.6 F	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 hol	S - Speed D - Density FFS - Free-flow BFFS - Base frour ur volume	-	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11
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		RAMP	S AND RAM	P JUNCTI	ONS WO	RKS	HEET			
General Infor	rmation			Site Infor						
Analyst				eeway/Dir of Tr		I-95 NE				
Agency or Company	AEC	OM		nction		Seg 11	-Off Ramp	Hillsboro EB		
Date Performed				risdiction			1.0040			
Analysis Time Perio			Ar	alysis Year		No-Bui	ld 2040			
Project Description	SW TULIT SLIEE									
		Eroowov Num	ber of Lanes, N	3						
Upstream Adj F	Ramp	-							Downstrea	m Adj
✓ Yes	✓ On	Ramp Numbe		1					Ramp	
		Acceleration L	ane Length, L _A						🗌 Yes	On
No	Off	Deceleration I	_ane Length L _D	220					✓ No	Off
		Freeway Volu	me, V _F	6900						
L _{up} = 30	085 ft	Ramp Volume	e, V _D	750					L _{down} =	ft
			-Flow Speed, S _{FF}	70.0						
$V_{u} = 13$	320 veh/h	-	ow Speed, S _{FR}	45.0					V _D =	veh/h
				43.0						
Conversion t	1	der Base	Conditions		1	_				
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv		f _{HV}	f _p	v = V/PHF :	x f _{HV} x f _p
reeway	6900	0.95	Level	3	0	0	985	1.00	737	· ·2
Ramp	750	0.92	Level	2	0	_	990	1.00	82	
UpStream	1320	0.92	Level	2	0		990	1.00	144	
DownStream	1320	0.32	Levei	2	0	- 0.	330	1.00	144	.9
Downotream	1	Merge Areas						Diverge Areas		
stimation o					Estimat	ion o				
		<u> </u>						<u> </u>	<u>, </u>	
	V ₁₂ = V _F	1 101						• V _R + (V _F - V _F		
_{EQ} =	(Equa	ition 13-6 or	13-7)		L _{EQ} =		8	140.08 (Equati	on 13-12 or	13-13)
P _{FM} =	using	Equation (E	Exhibit 13-6)		P _{FD} =		0.	538 using Equ	uation (Exhib	it 13-7)
/ ₁₂ =	pc/h				V ₁₂ =		43	345 pc/h		
V_3 or V_{av34}	pc/h (Equation 13	-14 or 13-17)		V_3 or V_{av34}		30)27 pc/h (Equ	ation 13-14	or 13-17
Is V_3 or $V_{av34} > 2,70$,			_∼ > 2.7		✓Yes □No		
Is V_3 or $V_{av34} > 2,7$ Is V_3 or $V_{av34} > 1.5$						•		Yes Vo		
			-16, 13-18, or			•		572 pc/h (Equ	ation 12 16	12 10
f Yes,V _{12a} =	13-19)		-10, 10-10, 01		If Yes,V _{12a} =	=		r 13-19)	allon 15-10	, 13-10,
Capacity Che	ecks				Capacit	v Ch				
	Actual	C	apacity	LOS F?	<u> </u>	,	Actual	Са	pacity	LOS F
		t i			V _F		7372	Exhibit 13-8	· · · · · · · · · · · · · · · · · · ·	Yes
		E			· · · ·	V			_	
V		Exhibit 13-8			$V_{FO} = V_{F}$		6549	Exhibit 13-8		No
V _{FO}									0 0100	No
V _{FO}					V _R		823	Exhibit 13-1	0 2100	
	g Merge In	fluence A	rea					rge Influen		110
	g Merge In Actual		rea Desirable	Violation?		nterin			ce Area	Violation
Flow Entering	T			Violation?	Flow En	nterin	g Dive	rge Influen	ce Area	
Flow Entering V _{R12}	Actual	Max Exhibit 13-8	Desirable	Violation?	Flow En	nterin	g Dive Actual 1345	rge Influen Max Desirab Exhibit 13-8	ce Area ble 4400:All	Violation
Flow Entering V _{R12} Level of Serv	Actual	Max Exhibit 13-8	Desirable if not F)	Violation?	Flow En V ₁₂ Level of	f Serv	g Dive Actual 1345 /ice De	rge Influen Max Desirab Exhibit 13-8 termination	ce Area ble 4400:All n (if not F	Violation No
Flow Entering V _{R12} Level of Serv D _R = 5.475 + 0	Actual vice Detern	Max Exhibit 13-8	Desirable if not F)	Violation?	Flow Er V ₁₂ Level of	f Serv	g Dive Actual 1345 /ice De 1.252 + 0	rge Influen Max Desirab Exhibit 13-8	ce Area ble 4400:All n (if not F	Violation
Flow Entering V _{R12} Level of Serv D _R = 5.475 + 0 D _R = (pc/mi/lr	Actual vice Detern .00734 v _R + 1	Max Exhibit 13-8	Desirable if not F)	Violation?	Flow En V ₁₂ Level of D _R = 42	f Serv D _R = 4 2.5 (pc.	g Dive Actual 1345 /ice De 1.252 + 0 /mi/ln)	rge Influen Max Desirab Exhibit 13-8 termination	ce Area ble 4400:All n (if not F	Violation
Flow Entering V_{R12} Level of Servent $D_R = 5.475 + 0$ $D_R = (pc/mi/lr OS = (Exhibit)$	Actual vice Detern .00734 v _R + 1 13-2)	Max Exhibit 13-8	Desirable if not F)	Violation?	Flow Er V ₁₂ Level of D _R = 42 LOS = F	terin f Serv D _R = 4 2.5 (pc. (Exhit	g Dive Actual 1345 /ice De 1.252 + 0 /mi/ln) bit 13-2)	rge Influen Max Desirat Exhibit 13-8 termination .0086 V ₁₂ - 0.	ce Area ble 4400:All n (if not F	Violation
Flow Entering V_{R12} Level of Serv $D_R = 5.475 + 0$ $D_R = (pc/mi/lr$ OS = (Exhibit)	Actual vice Detern .00734 v _R + 1 13-2)	Max Exhibit 13-8	Desirable if not F)	Violation?	Flow En V ₁₂ Level of D _R = 42	terin f Serv D _R = 4 2.5 (pc. (Exhit	g Dive Actual 1345 /ice De 1.252 + 0 /mi/ln) bit 13-2)	rge Influen Max Desirat Exhibit 13-8 termination .0086 V ₁₂ - 0.	ce Area ble 4400:All n (if not F	Violation
Flow Entering V_{R12} Level of Serv $D_R = 5.475 + 0$ $D_R = (pc/mi/lr$ LOS = (Exhibit) Speed Detern	Actual vice Detern .00734 v _R + 1 1) 13-2) mination	Max Exhibit 13-8	Desirable if not F)	Violation?	Flow Er V_{12} Level of $D_R = 42$ LOS = F Speed L	terin f Serv D _R = 4 2.5 (pc. (Exhit	g Dive Actual 1345 /ice De 1.252 + 0 /mi/ln) bit 13-2)	rge Influen Max Desirab Exhibit 13-8 termination .0086 V ₁₂ - 0.	ce Area ble 4400:All n (if not F	Violation
Flow Entering V_{R12} Level of Serv $D_R = 5.475 + 0$ $D_R = (pc/mi/lr$ OS = (Exhibit) Speed Detern $M_S = (Exibit 1)$	Actual vice Detern .00734 v _R + 1 1) 13-2) mination 3-11)	Max Exhibit 13-8	Desirable if not F)	Violation?	Flow Er V_{12} Level of $D_R = 42$ LOS = F Speed L $D_s = 0.$	terin f Serv D _R = 4 2.5 (pc, (Exhite Detern 372 (E	g Dive Actual 1345 /ice De 1.252 + 0 /mi/ln) bit 13-2) minatic xhibit 13	rge Influen Max Desirab Exhibit 13-8 termination .0086 V ₁₂ - 0.	ce Area ble 4400:All n (if not F	Violation
Flow Entering V_{R12} Level of Serv $D_R = 5.475 + 0$ $D_R = (pc/mi/lr)$ OS = (Exhibit) Speed Detern $M_S = (Exibit 1)$ $S_R = mph (Exhibit)$	Actual vice Detern .00734 v _R + 1 13-2) mination 3-11) hibit 13-11)	Max Exhibit 13-8	Desirable if not F)	Violation?	Flow Er V_{12} Level of $D_R = 42$ LOS = F Speed L $D_s = 0.$ $S_R = 59$	f Serv D _R = 4 2.5 (pc. (Exhik Deterr 372 (E 9.6 mph	g Dive Actual 1345 1.252 + 0 /mi/ln) bit 13-2) minatic xhibit 13- (Exhibit	rge Influen Max Desirab Exhibit 13-8 termination .0086 V ₁₂ - 0. 000 -12) 13-12)	ce Area ble 4400:All n (if not F	Violation
Flow Entering V_{R12} Level of Serv $D_R = 5.475 + 0$ $D_R = (pc/mi/lr)$ OS = (Exhibit) Speed Detern $M_S = (Exibit 1)$ $S_R^2 = mph (Ext)$ $S_0^2 = mph (Ext)$	Actual vice Detern .00734 v _R + 1 1) 13-2) mination 3-11)	Max Exhibit 13-8	Desirable if not F)	Violation?	Flow Er V_{12} Level of $D_R = 42$ LOS = F Speed L $D_s = 0.$ $S_R = 59$ $S_0 = 70$	Image: state of the s	g Dive Actual 1345 /ice De 1.252 + 0 /mi/ln) bit 13-2) minatic xhibit 13	rge Influen Max Desirat Exhibit 13-8 termination .0086 V ₁₂ - 0. 000 -12) 13-12) 13-12)	ce Area ble 4400:All n (if not F	Violation

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 NB Seg 12-l No-Build	Bet Off & On Hillsbord I 2040
Project Description SW 10th					
Oper.(LOS)			Des.(N)	Pla	anning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K	6150	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R	0.95 3 0	
Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	General Terrain: Grade % Length Up/Down %	Level mi	
Calculate Flow Adjustr	nents				
f _p	1.00		E _R	1.2	
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		ft			
Rt-Side Lat. Clearance		ft	f _{LW}		mph
Number of Lanes, N	3		f _{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			
LOS and Performance	Measures		Design (N)		
<u>Operational (LOS)</u> v _p = (V or DDHV) / (PHF x N : S D = v _p / S	58.6 37.4	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	f _{HV} x f _p)	pc/h/ln mph pc/mi/ln
	E		Required Number of Lanes, N Factor Location		
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base fre	-	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

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Gonara	l Informati	00			Site Info	rmation			
Genera	i informati	on			Site into	rmation			
Analyst Agency/Co Date Perfor Analysis Tir	med	AECOI PM	М		Freeway/Dir Weaving Seg Analysis Yea	gment Locati	•	IB 3-Bet On & C uild 2040	Off Hillsboro
^D roject Des I nputs	scription SW 10t	h Street SIMF	2						
Weaving nu Weaving se Freeway fre	onfiguration umber of lanes, l egment length, L ee-flow speed, F	s FS	r Basa Ca	One-Sided 4 790ft 70 mph	Segment typ Freeway min Freeway max Terrain type	imum speed			Freewa 24(Lev
Conver	sions to po	PHF	Truck (%)	RV (%)	E _T	E _R	f _{HV}	fp	v (pc/h)
V _{FF}	5460	0.95	3	0	1.5	1.2	0.985	1.00	5834
V _{RF}	730	0.92	2	0	1.5	1.2	0.990	1.00	801
V _{FR}	690	0.92	2	0	1.5	1.2	0.990	1.00	758
V _{RR}	0	0.95	2	0	1.5	1.2	0.990	1.00	0
V _{NW}	5834			-				V =	7393
V _W	1559								
VR	0.211								
Config	uration Cha	aracteris	tics						
	naneuver lanes,			2 lc	Minimum we	aving lane c	hanges, LC _{MIN}		1559 lc
	e density, ID	WE		0.7 int/mi	Weaving lan	e changes, L	_C _w		1770 lc
Minimum F	RF lane changes	, LC _{rf}		1 lc/pc	Non-weaving	860 lc			
Minimum F	R lane changes	, LC _{FR}		1 lc/pc	Total lane ch	nanges, LC _{AL}	L		2630 lc
Minimum F	R lane changes	, LC _{RR}		lc/pc	Non-weaving	g vehicle inde	ex, I _{NW}		32
Weavin	g Segmen	t Speed,	Density, I	_evel of	Service,	and Cap	oacity		
Weaving s	egment flow rate	e, V		7291 veh/h	Weaving inte				0.58
Weaving s	egment capacity	, c _w		8296 veh/h	Weaving seg				49.9 mp
•	egment v/c ratio			0.879	Average wea				49.7 mp
-	egment density,	D	3	7.1 pc/mi/ln	Average nor				49.9 mp
Level of Se	ervice, LOS			E	Maximum we	eaving length	n, L _{MAX}		4648

Chapter 13, "Freeway Merge and Diverge Segments". b. For volumes that exceed the weaving segment capacity, the level of service is "F".

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	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	AECOM PM		Highway/Direction of Travel From/To Jurisdiction Analysis Year	I-95 NB Seg 14- No-Build	Bet Off & On Hillsbord 1 2040
Project Description SW 10th	n Street SIMR				·
Oper.(LOS)			Des.(N)		anning Data
<i>Flow Inputs</i> Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D	6190	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 Eloy: Adjuste			Up/Down %		
Calculate Flow Adjustn	1.00		E _R	1.2	
f _ρ Ε _Τ	1.5		⊂ _R f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.985	
Speed Inputs			Calc Speed Adj and FFS		
Lane Width Rt-Side Lat. Clearance		ft ft	f _{LW}		mph
Number of Lanes, N Total Ramp Density, TRD	3	ramps/mi	f _{LC} TRD Adjustment		mph 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	< f _{HV} x f _p) 2205 58.3 37.8 E	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		
	S - Speed D - Density FFS - Free-flow BFFS - Base fro	-	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11
LOS - Level of service DDHV - Directional design ho	ur volume	ee-flow speed	1-		IRD - Page 11

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			REEWA	WEAV		_			
Genera	I Informati	on			Site Info	rmation			
-	rmed me Period	AECO PM			Freeway/Dir Weaving Seg Analysis Yea	gment Locati		IB 5-Bet On & C ıild 2040	Off to Exp
^{>} roject De: I nputs	scription SW 10t	h Street SIM	2						
Weaving n Weaving se Freeway fr	onfiguration umber of lanes, N egment length, L, ee-flow speed, F rsions to pe	s FS	r Baso Co	Two-Sided 3 4665ft 70 mph	Segment typ Freeway min Freeway ma: Terrain type	imum speed			Freewa 24(Lev
COILVEI	V (veh/h)	PHF	Truck (%)	RV (%)	E _T	E _R	f _{HV}	fp	v (pc/h)
V _{FF}	5040	0.95	3	0	1.5	к 1.2	0.985	1.00	5385
V _{RF}	610	0.92	2	0	1.5	1.2	0.990	1.00	670
V _{FR}	1150	0.92	2	0	1.5	1.2	0.990	1.00	1263
V _{RR}	130	0.92	2	0	1.5	1.2	0.990	1.00	143
V _{NW}	7318							V =	7461
V _W	143								
VR	0.019								
Config	uration Cha	aracteris	tics		_				
Minimum r	maneuver lanes,	N _{WL}		0 lc	Minimum we	aving lane c	hanges, LC _{MIN}		lc
Interchang	e density, ID			0.7 int/mi	Weaving lan	e changes, L	-C _w		lc
Minimum F	RF lane changes,	LC _{RF}		0 lc/pc	Non-weaving	g lane chang	es, LC _{NW}		lc
Minimum F	R lane changes,	LC _{FR}		0 lc/pc	Total lane ch	nanges, LC _{AL}	L		lc
Minimum F	RR lane changes	, LC _{RR}		3 lc/pc	Non-weaving	g vehicle inde	ex, I _{NW}		
Weavir	ng Segmen ⁻	t Speed,	Density, I	Level of	Service,	and Cap	pacity		
•	egment flow rate			7360 veh/h 6813 veh/h	Weaving inte Weaving seg				mp
	egment v/c ratio	, ⁰ w		1.080	Average wea				, mp
•	egment density,	D		pc/mi/ln	Average nor				mp
•	ervice, LOS			F	Maximum w	• •	1444		5905
Notes						0 - 0-	· IVIAA		

Chapter 13, "Freeway Merge and Diverge Segments". b. For volumes that exceed the weaving segment capacity, the level of service is "F".

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	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	AECOM 6/26/2017 PM		Highway/Direction of Travel From/To Jurisdiction Analysis Year	I-95 NB Seg 16-I FDOT D No-Build	
Project Description SW 10th	I Street SIMR		Des.(N)	- Dla	nning Data
Flow Inputs			Des.(III)		Tilling Data
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D	5650	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		Up/Down %		
f _p E _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	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	c f _{HV} x f _p)2012 62.4 32.3 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 frout ur volume	-	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11
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	BASIC 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 No-Build	et Hillsboro & Palmette I 2040
Project Description SW 10th	n Street SIMR		Des.(N)		anning Data
Flow Inputs			Des.(III)		anning Data
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D	4870	veh/h veh/day veh/h	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade % Length Up/Down %	0.95 3 0 Level mi	
Calculate Flow Adjustn	nents				
f _p E _T	1.00 1.5		E _R f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	1.2 0.985	
Speed Inputs			Calc Speed Adj and FFS	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) 1734 66.7 26.0 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 fro ur volume	-	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11
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_			REEWA	(WEAV		_			
Genera	al Informati	on			Site Info	rmation			
-	rmed me Period	AECO AM			Freeway/Dir Weaving Seg Analysis Yea	gment Locati		B -Bet On from uild 2040	Exp & Off
Project De Inputs	scription SW 10t	h Street SIMF	२						
Weaving n Weaving s Freeway fr	onfiguration umber of lanes, I egment length, L ee-flow speed, F	s FS	r Baco Co	Two-Sided 3 5085ft 70 mph	Segment typ Freeway min Freeway max Terrain type	imum speed			Freewa 24(Lev
Conver	V (veh/h)	PHF	Truck (%)	RV (%)	Ε _Τ	E _R	f _{HV}	fp	v (pc/h)
V _{FF}	3585	0.95	3	0	1.5	1.2	0.985	1.00	3830
V _{RF}	1265	0.92	2	0	1.5	1.2	0.990	1.00	1389
V _{FR}	1285	0.92	2	0	1.5	1.2	0.990	1.00	1411
V _{RR}	145	0.92	2	0	1.5	1.2	0.990	1.00	159
V _{NW}	6630							V =	6789
V _W	159								
VR	0.023								
Config	uration Cha	aracteris	tics						
Minimum r	maneuver lanes,	N _{WL}		0 lc	Minimum we	aving lane c	hanges, LC _{MIN}		477 lc.
Interchang	je density, ID			0.7 int/mi	Weaving lan	e changes, L	-C _w		848 lc.
Minimum I	RF lane changes	, LC _{RF}		0 lc/pc	Non-weaving	g lane chang	es, LC _{NW}		3167 lc
Minimum I	R lane changes	, LC _{FR}		0 lc/pc	Total lane ch	nanges, LC _{AL}	L		4015 lc
Minimum I	RR lane changes	, LC _{RR}		3 lc/pc	Non-weaving	g vehicle inde	ex, I _{NW}		236
Weavir	ng Segmen	t Speed,	Density, I	Level of	Service,	and Cap	pacity		
•	egment flow rate			6704 veh/h 6899 veh/h	Weaving inte Weaving seg	•			0.18 55.8 mp
	egment v/c ratio	, ° _W		0.972	Average wea	aving speed,	S _w		61.3 mp
•	segment density,	D	40	0.5 pc/mi/ln	Average nor	n-weaving sp	eed, S _{NW}		55.7 mp
•	ervice, LOS			E	Maximum we				5944
Notes							INICVA		

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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COM 1 et SIMR 50 veh/h veh/day	Site Information Highway/Direction of Travel From/To Jurisdiction Analysis Year Des.(N) Peak-Hour Factor, PHF	I-95 SB Seg 3-Bet Off No-Build 2040	0
1 et SIMR 50 veh/h	From/To Jurisdiction Analysis Year Des.(N)	Seg 3-Bet Ofi No-Build 204	0
50 veh/h	<i>、</i> ,	Planning	j Data
	<i>、</i> ,		g Data
	Peak-Hour Factor, PHF		
	%Trucks and Buses, P_T	0.95 3 0	
veh/h	General Terrain: Grade % Length Up/Down %	Level mi	
6			
	E _R	1.2	
j			
	Calc Speed Adj and FFS	3	
ft ramps/mi	f _{LW} f _{LC} TRD Adjustment FFS	70.0	mph mph mph mph
sures	Design (N)		
r f _p) 1727 pc/h/ln 66.8 mph 25.9 pc/mi/ln C	<u>Design (N)</u> Design LOS	f _{HV} x f _p)	pc/h/ln mph pc/mi/ln
	Factor Location		
Density - Free-flow speed S - Base free-flow speed	f _p - Page 11-18	-13 f _{LC} TR	- Exhibit 11-8 - Exhibit 11-9 D - Page 11-11
	veh/day veh/h veh/h s veh/h s veh/h s ft ft ft ft ft ft ft ft ft ft	veh/day%Trucks and Buses, P_T %RVs, P_R General Terrain: Grade%RVs, P_R General Terrain: Gradeveh/h $Grade$ $Length$ Up/Down %s F_R ft ft F_R fLCftft fLCfLCramps/miTRD Adjustment0mph mphFFSDesign (N)Design (N)Design (N)SuresDesign (N) f_p) 1727 66.8 Cpc/h/ln mph f_p 25.9 Cpc/mi/ln C $Design (N)$ Design LOS $v_p = (V or DDHV) / (PHF x N x S)D = v_p / SRequired Number of Lanes, NSpeedDensity- Free-flow speedE_R - Exhibits 11-10, 11-12E_T - Exhibits 11-10, 11-11, 11-f_p - Page 11-18LOS, S, FFS, v_p - Exhibits 11-10, 11-11, 11-Design LOSv_p = (V or DDHV) / (PHF x N x S)D = v_p / SRequired Number of Lanes, N$	veh/day%Trucks and Buses, P_T 3%RVs, P_R 0General Terrain:LevelGrade% LengthmiUp/Down %S E_R 1.2 $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$ 0.985Calc Speed Adj and FFSftf_Lftf_Lramps/miTRD AdjustmentomphFFS70.0suresDesign (N)Design (N)SuresDesign (N)Design LOS $v_p = (V \text{ or DDHV}) / (PHF x N x f_{HV} x f_p)$ S $P = v_p / S$ Required Number of Lanes, NFactor LocationSpeed $E_R - Exhibits 11-10, 11-12$ $f_p - Page 11-18$ TRI S - Base free-flow speed

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		RAI	MPS AND	RAMP JUN	CTIONS W	ORKSHE	ET				
Genera	l Infor	nation			Site Infor	mation					
nalyst				Fr	eeway/Dir of Tra	avel I-	-95 SB				
gency or (Company	AEC	MC	Ju	nction	S	Seg 4-Mer	ge from Hi	llsboro WB		
ate Perfor					risdiction						
	me Period	AM		Ar	nalysis Year	N	lo-Build 2	040			
	scription	SW 10th Stree	t SIMR								
nputs											
pstream A	Adj Ramp			per of Lanes, N	3					Downstre	eam Adj
✓ Yes	🗌 On		Ramp Number		1					Ramp	
es res			Acceleration L	ane Length, L _A	950					Yes	🗌 On
No	✓ Off		Deceleration L	ane Length L _D						✓ No	Off
			Freeway Volur	ne, V _F	4850						
= qu	2175 f	ť	Ramp Volume	, V _R	750				l	_ _{down} =	ft
			Freeway Free-	Flow Speed, S _{FF}	70.0				l,		e le /le
'u =	1430 v	eh/h	Ramp Free-Flo		50.0					V _D =	veh/h
onver	rsion tr	nc/h lln		Conditions							
		V	r r		0/ T	a/ D	6		£.		F f
(pc/	/m)	(Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{H∨}	'	f _p	v – v/PH	F x f _{HV} x f _p
reeway		4850	0.95	Level	3	0	0.985		1.00		5182
Ramp		750	0.92	Level	2	0	0.990		1.00		823
JpStream		1430	0.92	Level	2	0	0.990		1.00		1570
ownStrea	am										
	<u> </u>		Merge Areas			F - 41			erge Areas		
stima	tion of	V ₁₂				Estimatio	on ot v	12			
		V ₁₂ = V _F	(P _{FM})				,	V = V.	+ (V _F - V _R)	P	
_{EQ} =		1919.87	(Equation	13-6 or 13-7)		I =			quation 13-1		13)
FM =		0.604	using Equati	on (Exhibit 13-6)		L _{EQ} = P -		-	ng Equation		-
12 =		3130		,		P _{FD} =					13-7)
		-		on 13-14 or 13-		$V_{12} =$		pc/			47)
$_3$ or V_{av34}		17)				V ₃ or V _{av34}	0 700	-	h (Equation 13	3-14 or 13-	17)
s V_3 or V_a	_{v34} > 2,700) pc/h? 🗌 Ye	s 🗹 No			Is V_3 or V_{av34}					
s V_3 or V_a	_{v34} > 1.5 *	V ₁₂ /2 Ve	s 🗌 No			Is V_3 or V_{av34}	₁ > 1.5 * V				
Yes,V _{12a}		3130	pc/h (Equatio	on 13-16, 13-		lf Yes,V _{12a} =		pc/ 13-1	h (Equation	13-16, 1	13-18, or
.24			13-19)			0 11			0)		
apaci	ty Che		1 0			Capacity	1				
		Actual	C	apacity	LOS F?			Actual	Сар		LOS F?
						V _F			Exhibit 13-8		_
V _F	0	6005	Exhibit 13-8		No	V _{FO} = V _F -	· V _R		Exhibit 13-8		
						V _R			Exhibit 13-		
									10		
IOW EI	ntering	Actual	fluence A	rea Desirable	Violation?	Flow Ent	Actu		Max Desir		Violation?
V		3953	Exhibit 13-8	4600:All	No	V ₁₂	Acit		Exhibit 13-8	able	VIOIALIOIT
V _R					INU		<u> </u>			. (if no	<u> </u>
			nination (i			1			rmination		<i>ц Г)</i>
			0.0078 V ₁₂ - 0.0	UUZI LA				o∠ + 0.0()86 V ₁₂ - 0.0	na r ^D	
	30.0 (pc/mi	,					c/mi/ln)				
OS = [) (Exhibit 1	3-2)				LOS = (E>	xhibit 13	-2)			
peed	Detern	nination				Speed De	etermi	nation			
l _s = 0).429 (Exib	oit 13-11)				D _s = (Ex	hibit 13-1	2)			
-		Exhibit 13-11)					h (Exhibit	13-12)			
		Exhibit 13-11)					h (Exhibit				
		Exhibit 13-13)				-	h (Exhibit				
= 6						• · · · · · · · · · · · · · · · · · · ·	(,			

	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst			Highway/Direction of Travel	1-95 SB	
Agency or Company	AECOM		From/To	Ramps	WB On & EB On
Date Performed Analysis Time Period	AM		Jurisdiction Analysis Year	No-Build 2	2040
Project Description SW 10th	h Street SIMR				
Oper.(LOS)			Des.(N)	Plan	ning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K	5600	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R	0.95 3 0	
Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	General Terrain: Grade % Length Up/Down %	Level mi	
Calculate Flow Adjustn	nents				
f _p	1.00		E _R	1.2	
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	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		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) 1994 62.7 31.8 D	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	S - Speed D - Density FFS - Free-flow BFFS - Base fre	-	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-	-13	f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11
DDHV - Directional design ho Copyright © 2016 University of Florida,			$HCS 2010^{\text{TM}}$ Version 6.90		erated: 5/22/2019 12:2

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_			REEWA	Y WEAV		_	Т		
Genera	al Informati	on			Site Info	rmation			
Analyst Agency/Co Date Perfo Analysis T		AECO AM	М		Freeway/Dir Weaving Seg Analysis Yea	gment Locati		B - Bet Hillsbor ıild 2040	o & 10th St
Project De Inputs	escription SW 10t	th Street SIM	2						
Weaving o Weaving r Weaving s Freeway f	configuration number of lanes, l segment length, L ree-flow speed, F	s FS		One-Sided 4 1830ft 70 mph	Segment typ Freeway min Freeway ma: Terrain type	imum speed			Freewa 240 Lev
Conve	rsions to p	1	1	1	1	1	.	r	·
	V (veh/h)	PHF	Truck (%)	RV (%)	Ε _Τ	E _R	f _{HV}	fp	v (pc/h)
V _{FF}	4180	0.95	3	0	1.5	1.2	0.985	1.00	4466
V _{RF}	890	0.92	2	0	1.5	1.2	0.990	1.00	977
V _{FR}	1420	0.92	2	0	1.5	1.2	0.990	1.00	1559
V _{RR}	0	0.95	0	0	1.5	1.2	1.000	1.00	0
V _{NW}	4466							V =	7002
V _W	2536								
VR	0.362								
Config	juration Cha	aracteris	tics		1				
Minimum	maneuver lanes,	N _{WL}		2 lc	Minimum we	eaving lane c	hanges, LC _{MIN}		lc
Interchan	ge density, ID			0.7 int/mi	Weaving lan	ie changes, L	-C _w		lc
Minimum	RF lane changes	, LC _{rf}		1 lc/pc	Non-weaving	g lane chang	es, LC _{NW}		lc
Minimum	FR lane changes	, LC _{FR}		0 lc/pc	Total lane ch	nanges, LC _{AL}	L		lc
Minimum	RR lane changes	, LC _{RR}		lc/pc	Non-weaving	g vehicle inde	ex, I _{NW}		
Weavi	ng Segmen	t Speed,	Density,	Level of	Service,	and Cap	pacity		
Weaving	segment flow rate	e, V		6911 veh/h	Weaving inte	ensity factor,	W		
Weaving	segment capacity	, c _w		6529 veh/h	-	gment speed			mp
Weaving	segment v/c ratio			1.058	Average wea	•	**		mp
-	segment density,	D		pc/mi/ln	Average nor	• •			mp
Level of S	Service, LOS			F	Maximum we	eaving length	n, L _{MAX}		6260
Notes									
Chapter 13	g segments longer t 3, "Freeway Merge	and Diverge Se	egments".	-		solated merge	and diverge are	eas using the	procedures of
	mes that exceed th ersity of Florida All	<u> </u>		he level of sei		OTM Version			ated: 5/22/20

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General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	AECOM AM		Highway/Direction of Travel From/To Jurisdiction Analysis Year	l-95 SB Seg 7-Be No-Build	et Off & On Ramp 2040
Project Description SW 10th					
Oper.(LOS)			Des.(N)	Pla	nning Data
Flow Inputs Volume, V AADT Peak-Hr Prop. of AADT, K	5070	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R	0.95 3 0	
Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	General Terrain: Grade % Length Up/Down %	Level mi	
Calculate Flow Adjustr	nents				
f _p	1.00		E _R	1.2	
E _T	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
Speed Inputs			Calc Speed Adj and FFS	5	
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)		
Dperational (LOS) v _p = (V or DDHV) / (PHF x N : S D = v _p / S LOS		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 / - Hourly volume / _p - Flow rate _OS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base free	-	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

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	RA	MPS AND	RAMP JUN		ORKSHE	ET			
General In	formation			Site Infor	mation				
nalyst			Fre	eeway/Dir of Tra	avel I-9	95 SB			
gency or Comp		COM	Ju	nction	Se	eg 8-Merge froi	n 10th St		
ate Performed				risdiction					
nalysis Time P			An	alysis Year	N	o-Build 2040			
	ion SW 10th Stre	et SIMR							
nputs		Froowov Num	ber of Lanes, N	3					
lpstream Adj R	amp							Downstre	eam Adj
✓ Yes	On	Ramp Number		1				Ramp	
103			ane Length, L _A	1470				🗌 Yes	🗌 On
No 🗸	/ Off	Deceleration L	ane Length L _D					🗹 No	Off
		Freeway Volur	ne, V _F	5070					
_{up} = 22	10 ft	Ramp Volume	, V _R	1550				L _{down} =	ft
		Freeway Free-	Flow Speed, S _{FF}	70.0				V _D =	veh/h
u = 14	20 veh/h	Ramp Free-Flo	ow Speed, S _{FR}	50.0				vD -	VEII/II
onversio	n to pc/h Un	der Base (Conditions						
	V	PHF	Terrain	%Truck	%Rv	f	f	v = V/РН	F x f _{HV} x f _p
(pc/h)	(Veh/hr)					f _{HV}	r r		I.
reeway	5070	0.95	Level	3	0	0.985	1.00		5417
Ramp	1550	0.92	Level	2	0	0.990	1.00		1702
JpStream	1420	0.92	Level	2	0	0.990	1.00		1559
ownStream		Marria Araaa							
stimatior	2 of v	Merge Areas			Estimatio		Diverge Areas		
.5011100		·			Lotinatio	12			
	$V_{12} = V_{F}$	- (P _{FM})				V ₁₂ =	$V_{R} + (V_{F} - V_{R})$)P _{FD}	
EQ =	2389.1	5 (Equation	13-6 or 13-7)		L _{EQ} =		(Equation 13-	12 or 13-	13)
FM =	0.607	using Equati	ion (Exhibit 13-6)		P _{FD} =		using Equatio		-
12 =	3289	pc/h			V ₁₂ =		pc/h	,	,
₃ or V _{av34}		pc/h (Equation	on 13-14 or 13-		V_3^{12} or V_{av34}^{12}		pc/h (Equation 1	3-14 or 13-	17)
	17)	— • •				> 2 700 pc/h?	Yes No	• • • • • •	,
	2,700 pc/h? Ye								
$s v_3 \text{ or } v_{av34} >$	1.5 * V ₁₂ /2 Ve		10.10.10			1.0 12/2	pc/h (Equation	n 13-16, 1	13-18, or
Yes,V _{12a} =		pc/h (Equatio ⁻ 13-19)	on 13-16, 13-		lf Yes,V _{12a} =	1	3-19)	,	,
Capacity C		10 10)			Capacity	Checks			
	Actual	C	apacity	LOS F?		Actual	Car	acity	LOS F?
					V _F		Exhibit 13-8	1	
V	7440	Euclide 40.0		NI-	V _{FO} = V _F - 1	Va	Exhibit 13-8	_	
V_{FO}	7119	Exhibit 13-8		No		*R	Exhibit 13-		
					V _R		10		
low Ente	ring Merge I	nfluence A	rea		Flow Ente	ering Dive	rge Influen	ce Area	2
	Actual	Max [Desirable	Violation?		Actual	Max Desi	rable	Violation?
V _{R12}	4991	Exhibit 13-8	4600:All	Yes	V ₁₂		Exhibit 13-8		
evel of S	ervice Deter	mination (i	f not F)		Level of S	Service De	eterminatio	n (if no	t F)
D _R = 5.4	75 + 0.00734 v _R +	0.0078 V ₁₂ - 0.0	0627 L _A		D	_R = 4.252 + ().0086 V ₁₂ - 0.	009 L _D	
	pc/mi/ln)	12				/mi/ln)		D	
	hibit 13-2)					hibit 13-2)			
(termination					eterminati	<u></u>		
					t '		011		
•	(Exibit 13-11)				ů (nibit 13-12) v (Exhibit 13-12)		
	mph (Exhibit 13-11)					(Exhibit 13-12			
•	nph (Exhibit 13-11)				ů i	ı (Exhibit 13-12			
= 52.8 r	mph (Exhibit 13-13)				S = mph	ı (Exhibit 13-13)		
	rsity of Florida, All Rig	abte Reconved			HCS2010 [™]	V/		Generat	ed: 5/22/2019

	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 9-B No-Build	et 10th & Exit to Exp I 2040
Project Description SW 10th	Street SIMR		Des.(N)		anning Data
Flow Inputs			Jes.(N)		inning Data
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D	6620	veh/h veh/day veh/h	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade % Length Up/Down %	0.95 3 0 Level mi	
Calculate Flow Adjustn	nents		ľ		
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 x S D = v _p / S LOS	x f _{HV} x f _p) 2358 54.4 43.3 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 fro ur volume	-	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11
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		RAMP	S AND RAM	P JUNCTI	ONS WO	RKS	HEET			
General Info	rmation			Site Infor	mation					
Analyst			Fr	eeway/Dir of Tr	avel	I-95 SE	}			
Agency or Compan	y AECO	OM		nction		Seg 10	- Diverge t	o Express		
Date Performed				risdiction			1 00 40			
Analysis Time Peric			Ar	alysis Year		No-Bui	d 2040			
Project Description	Svv Tuth Stree									
Inputs			her of Lense N							
Upstream Adj I	Ramp	Ramp Numbe	ber of Lanes, N r of Lanes, N	3 1					Downstrea Ramp	m Adj
✓ Yes	🗹 On	· ·	ane Length, L _A	·					Yes	On
No	Off		_ane Length L _D	300					✓ No	Off
L _{up} = 6	6000 ft	Freeway Volu	1	6620					L _{down} =	ft
⊑ _{up} 0	1000 11	Ramp Volume	IX .	950					down	
V _u = 1	550 veh/h		-Flow Speed, S _{FF} ow Speed, S _{FR}	70.0 45.0					V _D =	veh/h
Conversion	to nc/h Uni			+0.0						
		ľ				1	-	-		
(pc/h)	(Veh/hr)	PHF	Terrain	%Truck	%Rv		f _{HV}	f _p	v = V/PHF :	x f _{HV} x f _p
Freeway	6620	0.95	Level	3	0	0.	985	1.00	707	'3
Ramp	950	0.92	Level	2	0	0.	990	1.00	104	13
UpStream	1550	0.92	Level	2	0	0.	990	1.00	170)2
DownStream										
- 4: 4:		Merge Areas			F ation of			Diverge Areas		
Estimation o	or v ₁₂				Estimat		^{t V} 12			
	V ₁₂ = V _F	(P _{FM})					V ₁₂ =	· V _R + (V _F - V _F	_R)P _{FD}	
_{EQ} =	(Equa	ation 13-6 or	13-7)		L _{EQ} =		11	022.53 (Equa	tion 13-12 c	or 13-13)
са Р _{FM} =	usina	Equation (Exhibit 13-6)		P _{FD} =		0.	535 using Equ	uation (Exhib	oit 13-7)
/ ₁₂ =	pc/h		,		V ₁₂ =			270 pc/h	,	,
V_3 or V_{av34}	-	Equation 13	-14 or 13-17)		V_3^{12} or V_{av34}^{12}			303 pc/h (Equ	ation 13-14	or 13_17
			-14 01 10-17			> 2 7		ZYes □No		
ls V ₃ or V _{av34} > 2,7										
Is V ₃ or V _{av34} > 1.5			-16, 13-18, or			•		Yes Vo	-Han 10 10	10 10
f Yes,V _{12a} =	13-19)		-10, 13-10, 01		If Yes,V _{12a} =	=		373 pc/h (Equ 13-19)	ation 13-16	, 13-18,
Capacity Ch	,	, 			Capacit	v Ch		10 10)		
	Actual	C	apacity	LOS F?	<u> </u>	<u> </u>	Actual	Ca	pacity	LOS F
			- 17		V _F		7073	Exhibit 13-8	· · · · · · · · · · · · · · · · · · ·	No
V		Exhibit 13-8			$V_{FO} = V_{F}$	- V	6030	Exhibit 13-8	_	No
V _{FO}					-					
							1043	Exhibit 13-1		No
	na iviorao in			Violotion	Flow En		<u> </u>	rge Influen		Violotion
Flow Enterin				Violation?			Actual	Max Desirab	le	Violation
	Actual		Desirable		14				4400 411	
V _{R12}	Actual	Exhibit 13-8			V ₁₂		270	Exhibit 13-8	4400:All	No
V _{R12} Level of Serv	Actual vice Detern	Exhibit 13-8	if not F)		Level of	f Serv	/ice De	terminatio	n (if not F	
V _{R12}	Actual vice Detern	Exhibit 13-8	if not F)		Level of	f Serv	/ice De		n (if not F	
V _{R12} Level of Ser D _R = 5.475 + 0	Actual vice Detern 0.00734 v _R + 1	Exhibit 13-8	if not F)		Level of	f Serv	/ ice De .252 + 0	terminatio	n (if not F	
V _{R12} L evel of Ser D _R = 5.475 + 0 D _R = (pc/mi/l	Actual vice Detern 0.00734 v _R + 1 n)	Exhibit 13-8	if not F)		Level of D _R = 4	f Serv D _R = 4 1.0 (pc.	/ ice De .252 + 0	terminatio	n (if not F	
V_{R12} Level of Ser $D_R = 5.475 + 0$ $D_R = (pc/mi/l_{OS} = (Exhibit)$	Actual vice Detern 0.00734 v _R + 1 n) t 13-2)	Exhibit 13-8	if not F)		Level of D _R = 4	f Ser D _R = 4 1.0 (pc. (Exhil	/ ice De 4.252 + 0 /mi/ln) pit 13-2)	terminatio .0086 V ₁₂ - 0.	n (if not F	
Level of Server D _R = 5.475 + 0 D _R = (pc/mi/l .OS = (Exhibit Speed Deterver	Actual vice Detern 0.00734 v _R + 1 n) t 13-2) mination	Exhibit 13-8	if not F)		Level of D _R = 4 [°] LOS = E Speed L	f Ser D _R = 4 1.0 (pc. (Exhil Deter	/ ice De 4.252 + 0 /mi/ln) pit 13-2)	terminatio .0086 V ₁₂ - 0.	n (if not F	
V_{R12} Level of Server $D_R = 5.475 + 0$ $D_R = (pc/mi/l)$ OS = (Exhibit) Speed Deterver $M_S = (Exibit)^2$	Actual vice Detern 0.00734 v _R + 1 n) t 13-2) mination 13-11)	Exhibit 13-8	if not F)		Level of $D_R = 4^{\circ}$ LOS = E Speed L $D_s = 0.$	f Serv D _R = 4 1.0 (pc (Exhit Deter .392 (E	/ice De 4.252 + 0 /mi/ln) bit 13-2) minatic xhibit 13-	terminatio .0086 V ₁₂ - 0. 0n .12)	n (if not F	
V_{R12} $D_{R} = 5.475 + 0$ $D_{R} = (pc/mi/l)$ $OS = (Exhibit)$ $Speed Deter$ $M_{S} = (Exibit)$	Actual vice Detern 0.00734 v _R + 1 n) t 13-2) mination 13-11) thibit 13-11)	Exhibit 13-8	if not F)		Level of $D_R = 4^{\circ}$ LOS = E Speed L $D_s = 0$. $S_R = 59$	f Serv D _R = 4 1.0 (pc. (Exhit Deter .392 (E 9.0 mph	vice De .252 + 0 /mi/ln) bit 13-2) minatic xhibit 13- (Exhibit	terminatio .0086 V ₁₂ - 0. .0086 V ₁₂ - 0. .12) 13-12)	n (if not F	
V_{R12} Level of Ser $D_{R} = 5.475 + 0$ $D_{R} = (pc/mi/l)$ $OS = (Exhibit)$ Speed Deter $M_{S} = (Exibit)$ $M_{S} = (Exibit)$ $M_{S} = (Exibit)$	Actual vice Detern 0.00734 v _R + 1 n) t 13-2) mination 13-11)	Exhibit 13-8	if not F)		$Level of$ $D_{R} = 4^{\prime}$ $LOS = E$ $Speed L$ $D_{s} = 0.$ $S_{R} = 59$ $S_{0} = 7^{\prime}$	f Serv D _R = 4 1.0 (pc (Exhil Deter .392 (E 9.0 mph 1.0 mph	/ice De 4.252 + 0 /mi/ln) bit 13-2) minatic xhibit 13-	terminatio .0086 V ₁₂ - 0. 0 n -12) 13-12) 13-12)	n (if not F	

General Information Analyst Agency or Company Date Performed Analysis Time Period Project Description SW 10th	AECOM AM Street SIMR		Site Information Highway/Direction of Travel	I-95 SB	
Agency or Company Date Performed Analysis Time Period Project Description SW 10th	AM				
Date Performed Analysis Time Period Project Description SW 10th	AM			Seg 11-Bet	Off Exp Off
Analysis Time Period Project Description SW 10th			From/To	Samples	
	Street SIMR		Jurisdiction Analysis Year	No-Build 204	40
🗹 Oper.(LOS)			Des.(N)	🗌 Plannir	ng Data
Flow Inputs					
Volume, V	5670	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			General Terrain:	Level	
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	mi	
			Op/Down %		
Calculate Flow Adjustm	ents				
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		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 M	leasures		Design (N)		
			Design (N)		
Operational (LOS)			Design LOS		
$v_p = (V \text{ or DDHV}) / (PHF x N x)$	··· P	pc/h/ln	$v_p = (V \text{ or DDHV}) / (PHF x N x)$	f _{HV} x f _p)	pc/h/ln
S	62.2	mph	S	πν p	mph
D = v _p / S	32.4	pc/mi/ln	$D = v_p / S$		pc/mi/ln
LOS	D		P Required Number of Lanes, N		P
Glossary			Factor Location		
N - Number of lanes	S - Speed				
	D - Density		E _R - Exhibits 11-10, 11-12	_	_W - Exhibit 11-8
-	FFS - Free-flow	speed	E _T - Exhibits 11-10, 11-11, 11-	-	_C - Exhibit 11-9
P	BFFS - Base fre	-	f _p - Page 11-18		RD - Page 11-1
DDHV - Directional design hou			LOS, S, FFS, v _p - Exhibits 11-2	2, 11-3	
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0		RAMP	S AND RAM			RKS	HEET			
General Info	ormation			Site Infor						
Analyst		<u></u>		eeway/Dir of Tr		I-95 SE				
Agency or Compa Date Performed	ny AEC	OM		nction risdiction		Seg 12	- Diverge 1	to Sample Rd		
ale Performed analysis Time Per	iod AM			alysis Year		No-Bui	ld 2040			
	n SW 10th Stree	et SIMR	7.4			NO DUI	10 20+0			
nputs										
	Dema	Freeway Num	ber of Lanes, N	3					Dourotros	vez A di
Upstream Ad	l Ramp	Ramp Number		1					Downstrea Ramp	am Adj
🗹 Yes	On		ane Length, L_{Δ}	I						
			- //	050					Ves 🗌	🗌 On
No	✓ Off		ane Length L _D	250					✓ No	Off
		Freeway Volu	1	5670					. –	а
L _{up} =	2000 ft	Ramp Volume	, V _R	1050					L _{down} =	ft
V -	050	Freeway Free	-Flow Speed, S _{FF}	70.0					V _D =	veh/h
V _u =	950 veh/h	Ramp Free-Fl	ow Speed, S _{FR}	45.0					۰D	VCII/II
Conversion	to pc/h Un									
	V			0/ Truck	0/ D) /		f	f	v = V/PHF	vf vf
(pc/h)	(Veh/hr)	PHF	Terrain	%Truck	%Rv		f _{HV}	f _p		* ' _{HV} * ' _p
reeway	5670	0.95	Level	3	0	0.	985	1.00	60	58
Ramp	1050	0.92	Level	2	0	0.	990	1.00	11	53
JpStream	950	0.92	Level	2	0	0.	990	1.00	10	43
DownStream										
		Merge Areas				-		Diverge Areas		
stimation	of v ₁₂				Estimat	ion o	t v ₁₂			
	V ₁₂ = V _F	(P _{FM})					V ₁₂ =	= V _R + (V _F - V _F)P _{FD}	
_{EQ} =	(Equa	ation 13-6 or	13-7)		L _{EQ} =		(Equation 13-1	2 or 13-13)
FM =	usina	Equation (E	xhibit 13-6)		P _{FD} =		0	556 using Equ	uation (Exhi	bit 13-7)
/ ₁₂ =	pc/h		,		V ₁₂ =			878 pc/h		,
V_3 or V_{av34}	•	(Equation 13)	-14 or 13-17)		V_3 or V_{av34}			180 pc/h (Equ	otion 12 1/	l or 12 17
			14 01 10-17)			<u> </u>				101 13-17
	,700 pc/h? 🗌 Ye							Yes No		
$s V_3 \text{ or } V_{av34} > 1$.5 * V ₁₂ /2 Ye		16 12 19 or		is v ₃ or v _{av}	₃₄ > 1.5		Yes Vo	10 16 10	10 0 10
Yes,V _{12a} =	13-19		-16, 13-18, or		If Yes,V _{12a} =	=		oc/h (Equation 9)	13-10, 13-	10, 01 13
Capacity Cl		/			Capacit	v Ch		• /		
	Actual	С	apacity	LOS F?			Actual	Са	pacity	LOS F
					V _F		6058	Exhibit 13-8		No
V		Exhibit 13-8			V _{FO} = V _F	- V	4905	Exhibit 13-8	_	_
V_{FO}		EXHIDIC 13-0				- • R			_	No
					V _R		1153	Exhibit 13-1		No
low Enteri	ng Merge Ir				Flow En	1		rge Influen		1
	Actual	i r	Desirable	Violation?			Actual	Max Desirat		Violation
V _{R12}		Exhibit 13-8			V ₁₂	3	3878	Exhibit 13-8	4400:All	No
evel of Sel	rvice Deterr	nination (i	f not F)		Level of	f Serv	/ice De	eterminatio	n (if not i	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	
_R = (pc/mi	/ln)				D _R = 37	7.0 (pc	/mi/ln)			
	, it 13-2)						, pit 13-2)			
Speed Dete					Speed L			<i>מ</i> ר		
•										
	13-11)				ŭ		xhibit 13	-		
0					S _R = 58	8.8 mph	(Exhibit	13-12)		
	xhibit 13-11)									
_R = mph (E	xhibit 13-11) xhibit 13-11)					2.9 mph	(Exhibit	13-12)		
n= mph (E 1)= mph (E					S ₀ = 72		(Exhibit (Exhibit			

		Site Information		
AECOM AM		Highway/Direction of Travel From/To Jurisdiction Analysis Year	I-95 SB Seg 13-L No-Build	Bet Off & On Ramps I 2040
		Des.(N)	Pla	Inning Data
4620	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain:	0.95 3 0 Level	
	ven/n	Grade % Length Up/Down %	mi	
nents				
1.00		E _R	1.2	
1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
		Calc Speed Adj and FFS	5	
3	ft ft ramps/mi	f _{LW} f _{LC} TRD Adjustment		mph mph mph
70.0	mph mph	FFS	70.0	mph
Measures		Design (N)		
x f _{HV} x f _p) 1645 67.7 24.3 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
		Factor Location		
BFFS - Base fre	-	f _p - Page 11-18		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11
	AM h Street SIMR 4620 4620 nents 1.00 1.5 3 70.0 Measures $x f_{HV} x f_p$) 1645 67.7 24.3 C S - Speed D - Density FFS - Free-flow	AM h Street SIMR 4620 veh/h veh/day veh/h nents 1.00 1.5 1.00 1.5 ft ft 3 70.0 mph mph Measures x $f_{HV} \times f_p$) 1645 pc/h/ln 67.7 mph 24.3 pc/mi/ln C S - Speed D - Density FFS - Free-flow speed BFFS - Base free-flow speed	AECOMHighway/Direction of Travel From/To Jurisdiction Analysis YearAMAnalysis Yearh Street SIMR \Box Des.(N)4620veh/hPeak-Hour Factor, PHF %Trucks and Buses, PT %RVs, PR General Terrain: Grade % Length Up/Down%1.00ER HV = 1/(1+PT(ET-1) + PR(ER-1))1.00ER HV = 1/(1+PT(ET-1) + PR(ER-1))1.00FR HV = 1/(1+PT(ET-1) + PR(ER-1))2.00PD(PT(ET-1) + PR(ER-1))2.01PD(PT(ET-1) + PR(ER-1))2.02PD(PT(ET-1) + PR(ER-1))2.03FFS - Free-flow SpeedBFFS - Base free-flow speed <td>AECOMHighway/Direction of Travel From/To JurisdictionI-95 SB Seg 13-1 JurisdictionAMAnalysis YearNo-Buildh Street SIMR\Box Des.(N)\Box Pla4620veh/h veh/dayPeak-Hour Factor, PHF %Trucks and Buses, PT %Trucks and Buses, PT 3 %RVs, PR Grade0 General Terrain: Up/Down %1.00ER HT TS1.2 (Frade % Length Up/Down %1.00ER ft ft ft ft1.2 fLC1.00FR ft ft ft ft ft ft ft ft ft ft1.2 fLC1.00math set Simplement ftI-92 ft ft ft ft ft ft ft ft ft ft ftft ft ft ft ft ft ft ft ft ftPace ft ft ft ft ft ft ft ft ft ft ft ftI-92 ft </br></br></br></td>	AECOMHighway/Direction of Travel From/To JurisdictionI-95 SB Seg 13-1 JurisdictionAMAnalysis YearNo-Buildh Street SIMR \Box Des.(N) \Box Pla4620veh/h veh/dayPeak-Hour Factor, PHF %Trucks and Buses, PT %Trucks and Buses, PT 3 %RVs, PR Grade0 General Terrain: Up/Down %1.00ER HT TS1.2 (Frade % Length Up/Down %1.00ER ft ft ft ft1.2 fLC1.00FR ft ft ft ft ft ft ft ft ft ft1.2 fLC1.00math set Simplement ftI-92 ft ft ft ft ft ft ft ft ft ft ftft ft ft ft ft ft ft ft ft ftPace ft ft ft ft ft ft ft ft ft ft

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Genera	I Information		REEWA			ormation			
Analyst Agency/Co Date Perfor Analysis Tir	mpany med	AECOM AM	I		Freeway/Dir	of Travel gment Locati	I-95 S on Seg 1	B 4- Bet Samp uild 2040	le & Copan
Project Des Inputs	scription SW 10t	h Street SIMR							
Weaving co Weaving nu Weaving se	onfiguration umber of lanes, N egment length, L ee-flow speed, Fl	3		One-Sided 4 1650ft 70 mph		nimum speed Iximum capao			Free 2 L
Conver	sions to po	c/h Under	Base Co	ondition	S				
	V (veh/h)	PHF	Truck (%)	RV (%)	Ε _Τ	E _R	f _{HV}	fp	v (pc/ł
V _{FF}	3915	0.95	3	0	1.5	1.2	0.985	1.00	4183
V _{RF}	1970	0.92	2	0	1.5	1.2	0.990	1.00	2163
V _{FR}	705	0.92	2	0	1.5	1.2	0.990	1.00	774
V _{RR}	0	0.95	0	0	1.5	1.2	1.000	1.00	0
V _{NW}	4183			-		-		V =	7120
V _w	2937								
VR	0.412								
Config	uration Cha	aracterist	ics		•				
Minimum n	naneuver lanes, l	N _{WL}		2 lc	Minimum we	eaving lane c	hanges, LC _{MIN}		
Interchang	e density, ID			0.7 int/mi	Weaving lar	ne changes, l	_C _w		
Minimum F	RF lane changes,	$\mathrm{LC}_{\mathrm{RF}}$		1 lc/pc	Non-weavin	g lane chang	es, LC _{NW}		
Minimum F	R lane changes,	$\rm LC_{FR}$		1 lc/pc	Total lane c	hanges, LC _{AL}	L		
Minimum F	RR lane changes	, LC _{RR}		lc/pc	Non-weavin	g vehicle ind	ex, I _{NW}		
Weavin	g Segment	t Speed, I	Density, I	Level of	Service,	and Ca	oacity		
Weaving s	egment flow rate egment capacity,			7029 veh/h 5732 veh/h	Weaving se	ensity factor, gment speed aving speed,	, S		
•	egment v/c ratio egment density, l	n		1.226	_	n-weaving speed,			
Ŭ Ŭ	egment density, i ervice, LOS	U		pc/mi/ln F	•	veaving lengtl	1111		68
Notes				•			', LMAX		00
a. Weaving : Chapter 13,	segments longer the segments longer the segments longer the segment of the section of the sectio	and Diverge Seg	gments".	-		solated merge	and diverge ar	eas using the	procedures
	sity of Florida, All	<u> </u>				10 TM Versior		-	erated: 5/2

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			GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	AECOM PM		Highway/Direction of Travel From/To Jurisdiction Analysis Year	I-95 SB Seg 1-B No-Build	et Hillsboro & Palmette I 2040
Project Description SW 10th	n Street SIMR				
Oper.(LOS)			Des.(N)	Pla	anning Data
<i>Flow Inputs</i> Volume, V AADT	5150	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	
Ê _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	3	ft ft ramps/mi	f _{Lw} f _{LC} TRD Adjustment		mph mph 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	c f _{HV} x f _p) 1834 65.3 28.1 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 fro ur volume	-	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11
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Gener	al Information		REEWA			ormation			
Analyst Agency/C Date Perf Analysis ⊺		AECON PM	I		Freeway/Dir Weaving Se Analysis Yea	SB 2-Bet On from uild 2040	Exp & Off		
Project De Inputs	escription SW 10t	h Street SIMR							
Weaving Weaving Weaving	configuration number of lanes, N segment length, L _s free-flow speed, Fl	3		Two-Sided 3 5085ft 70 mph		nimum speed aximum capad			Freev 2- Le
Conve	ersions to po	c/h Under	Base Co	ondition	S S				
	V (veh/h)	PHF	Truck (%)	RV (%)	Ε _Τ	E _R	f _{HV}	fp	v (pc/h)
V _{FF}	4010	0.95	3	0	1.5	1.2	0.985	1.00	4284
V _{RF}	1460	0.92	2	0	1.5	1.2	0.990	1.00	1603
V _{FR}	1140	0.92	2	0	1.5	1.2	0.990	1.00	1252
V _{RR}	130	0.92	2	0	1.5	1.2	0.990	1.00	143
V _{NW}	7139							V =	7282
V _W	143								
VR	0.020								
Config	juration Cha	aracterist	ics						
Minimum	maneuver lanes, l	N _{WL}		0 lc	Minimum we	eaving lane c	hanges, LC _{MI}	N	
	ge density, ID			0.7 int/mi	Weaving lar	ne changes, l	_C _w		
	RF lane changes,	ru -		0 lc/pc	Non-weavin	ig lane chang	jes, LC _{NW}		
Minimum	FR lane changes,	LC_{FR}		0 lc/pc	Total lane c	hanges, LC _{AL}	L		
Minimum	RR lane changes	, LC _{RR}		3 lc/pc	Non-weavin	ig vehicle ind	ex, I _{NW}		
Weavi	ng Segment	t Speed, I	Density, I	Level of	ľ				
U U	segment flow rate			7189 veh/h	Ŭ	ensity factor,			_
-	segment capacity,	c _w		6907 veh/h	, in the second s	gment speed aving speed,			r
•	segment v/c ratio			1.041	-	• •	**		r
Ŭ,	segment density, l Service, LOS	U		pc/mi/ln F		n-weaving sp /eaving lengtl			r 500
Notes				I	IVIAAIIIIUIII W	reaving lengt	⊓, ∟ _{MAX}		590
a. Weaving Chapter 13	g segments longer tl 3, "Freeway Merge a mes that exceed the	and Diverge Seg	gments".	-		solated merge	and diverge a	reas using the	procedures
	ersity of Florida, All	0 0		ne level of set		0 TM Version			ated: 5/22/2

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	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	AECOM PM		Highway/Direction of Travel From/To Jurisdiction Analysis Year	I-95 SB Seg 3-B No-Build	et Off & On Ramp I 2040
Project Description SW 10th	Street SIMR				
Oper.(LOS)			Des.(N)	Pla	anning Data
<i>Flow Inputs</i> Volume, V AADT	5470	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 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	8	
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 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) 1948 63.5 30.7 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 hol	S - Speed D - Density FFS - Free-flow BFFS - Base fro ur volume	-	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11
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	RA	MPS AND		CTIONS W	ORKSHE	ET			
General Info	rmation			Site Infor	mation				
Analyst			Fre	eeway/Dir of Tr	avel I-(95 SB			
Agency or Company	AEC	OM	Ju	nction	S	eg 4-Merge fro	m Hillsboro WB		
Date Performed				risdiction					
nalysis Time Perio			An	alysis Year	N	o-Build 2040			
Project Description	SW 10th Stree	I SIMR							
nputs			ber of Lanes, N	3					
Jpstream Adj Ramp)			3				Downstre	eam Adj
✓ Yes 🗌 O	n	Ramp Number		1				Ramp	
			ane Length, L _A	950				🗌 Yes	🗌 On
🗌 No 🛛 🗹 O	ff	Deceleration L	ane Length L _D					🗹 No	Off
		Freeway Volur	ne, V _F	5470					
_{up} = 2175	ft	Ramp Volume	, V _R	890				L _{down} =	ft
/ / 0=0		Freeway Free-	Flow Speed, S _{FF}	70.0				V _D =	veh/h
/ _u = 1270	veh/h	Ramp Free-Flo	ow Speed, S _{FR}	50.0				v _D –	Ven/m
Conversion t	to pc/h Un		110						
	V	PHF		% Truck	%Rv	f	f	у – \//РН	Fyf yf
(pc/h)	(Veh/hr)		Terrain	%Truck		f _{HV}	r.		F x f _{HV} x f _p
Freeway	5470	0.95	Level	3	0	0.985	1.00		5844
Ramp	890	0.92	Level	2	0	0.990	1.00		977
UpStream	1270	0.92	Level	2	0	0.990	1.00		1394
DownStream									
stimation o		Merge Areas			Estimatio		Diverge Areas		
Sumation 0					LSumano	12			
	V ₁₂ = V _F	(P _{FM})				V ₁₂ =	V _R + (V _F - V _R))P _{ED}	
EQ =	2094.49	equation (Equation	13-6 or 13-7)		L _{EQ} =	•=	(Equation 13-		13)
P _{FM} =	0.604	using Equat	ion (Exhibit 13-6)		P _{FD} =		using Equatio		-
′ ₁₂ =	3530	pc/h			V ₁₂ =		pc/h	(- /
V_3 or V_{av34}		pc/h (Equatio	on 13-14 or 13-		V_3 or V_{av34}		pc/h (Equation 1	3-14 or 13-	17)
	17)	_				$> 2.700 \text{ nc/h}^2$	Yes No	0 14 01 10	,
s V ₃ or V _{av34} > 2,7									
Is V ₃ or V _{av34} > 1.5						× 1.5 v 12/2	Yes No pc/h (Equation	n 13-16	13-18 or
f Yes,V _{12a} =		pc/h (Equatio 13-19)	on 13-16, 13-		If Yes,V _{12a} =	1	3-19)	110-10,	10-10, 01
Capacity Che		15-19)			Capacity	Checks			
	Actual	C	apacity	LOS F?		Actual	Car	pacity	LOS F?
	/ lotau	1 Ť	apuony	2001.	V _F	71010101	Exhibit 13-8		
					· · · · · · · · · · · · · · · · · · ·	V	Exhibit 13-8	_	
V _{FO}	6821	Exhibit 13-8		No	$V_{FO} = V_{F}$ -	^v R	Exhibit 13-		_
					V _R		10		
-low Enterin	q Merae In	fluence A	rea	•	Flow Ente	ering Dive	erge Influen	ce Area	3
	Actual	1	Desirable	Violation?		Actual	Max Desi		Violation?
V _{R12}	4507	Exhibit 13-8	4600:All	No	V ₁₂		Exhibit 13-8		
evel of Serv	vice Detern	nination (i	f not F)		·	Service De	eterminatio	n (if no	t F)
	+ 0.00734 v _R + 0	1	1				0.0086 V ₁₂ - 0.		/
0 _R = 34.2 (pc/r		12	A			/mi/ln)	12	U.	
OS = D (Exhibit	,					hibit 13-2)			
,	,								
Speed Deter						eterminati	on		
1 _S = 0.580 (Ex	ibit 13-11)				, i	nibit 13-12)			
6 _R = 53.8 mph	(Exhibit 13-11)					n (Exhibit 13-12			
63.4 mph	(Exhibit 13-11)				S ₀ = mph	n (Exhibit 13-12)		
	(Exhibit 13-13)				S = mph	n (Exhibit 13-13)		
	of Florida, All Rig	hta Daganyad			HCS2010 [™]) (analiana () () ()		Conorat	ed: 5/22/2019

	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company	AECOM		Highway/Direction of Travel From/To	•	et WB On & EB On
Date Performed Analysis Time Period	PM		Jurisdiction Analysis Year	Ramps No-Build	2040
Project Description SW 10th	h Street SIMR				
🗹 Oper.(LOS)			Des.(N)	Pla	nning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D	6360	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	
			Up/Down %		
Calculate Flow Adjustr	nents				
f _p	1.00		E _R	1.2	
E _T	1.5		-κ f _{HV} = 1/[1+Ρ _T (E _T - 1) + Ρ _R (E _R - 1)]	0.985	
Speed Inputs			Calc Speed Adj and FFS	S	
_ane Width		ft			
Rt-Side Lat. Clearance		ft	f _{LW}		mph
Number of Lanes, N	3		f _{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			·
LOS and Performance	Measures		Design (N)		
<u>Operational (LOS)</u> v _p = (V or DDHV) / (PHF x N : S D = v _p / S LOS	x f _{HV} x f _p) 2265 56.8 39.8 E	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	pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
	S - Speed D - Density FFS - Free-flow BFFS - Base fro	-	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11
LOS - Level of service DDHV - Directional design ho Copyright © 2016 University of Florida,	our volume	ee-flow speed	r -		merated: 5/22/2019

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			FREEWA	WEAV		_			
Genera	I Informati	on			Site Info	ormation			
-	rmed me Period	AECO PM			Freeway/Dir Weaving Seg Analysis Yea	gment Locati		B - Bet Hillsbor uild 2040	o & 10th St
Project De: Inputs	scription SW 10t	th Street SIM	3						
Weaving n Weaving se Freeway fr	onfiguration umber of lanes, I egment length, L ee-flow speed, F	s FS	r Base Co	One-Sided 4 1830ft 70 mph	Segment typ Freeway min Freeway ma Terrain type	imum speed			Freewa 24(Lev
	V (veh/h)	PHF	Truck (%)	RV (%)	E _T	E _R	f _{HV}	fp	v (pc/h)
V _{FF}	4860	0.95	3	0	1.5	1.2	0.985	1.00	5193
V _{RF}	830	0.92	2	0	1.5	1.2	0.990	1.00	911
V _{FR}	1500	0.92	2	0	1.5	1.2	0.990	1.00	1647
V _{RR}	0	0.95	0	0	1.5	1.2	1.000	1.00	0
V _{NW}	5193							V =	7751
V _W	2558								
VR	0.330								
Config	uration Cha	aracteris	tics		_				
Minimum r	naneuver lanes,	N _{WL}		2 lc	Minimum we	aving lane c	hanges, LC _{MIN}		lc
Interchang	e density, ID			0.7 int/mi	Weaving lan	ie changes, L	_C _w		lc
Minimum F	RF lane changes	, LC _{RF}		1 lc/pc	Non-weaving	g lane chang	es, LC _{NW}		lc
Minimum F	R lane changes	, LC _{FR}		0 lc/pc	Total lane cl	nanges, LC _{AL}	L		lc
Minimum F	RR lane changes	, LC _{RR}		lc/pc	Non-weaving	g vehicle inde	ex, I _{NW}		
Weavir	ig Segmen	t Speed,	Density,	Level of	Service,	and Cap	pacity		
Weaving s	egment flow rate egment capacity egment v/c ratio			7649 veh/h 7165 veh/h 1.067	Ŭ,	ensity factor, gment speed aving speed,	, S		mբ ՠբ
-	egment density, ervice, LOS	D		pc/mi/ln F	Average nor Maximum w	•			ՠբ 5908
Notes							IVICAA		

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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Agency or Company Date Performed Analysis Time Period	AECOM PM Street SIMR		Site Information Highway/Direction of Travel From/To Jurisdiction Analysis Year	l-95 SB Seg 7-Be	
Analyst Agency or Company Date Performed Analysis Time Period	PM		From/To Jurisdiction		
	Street SIMR		Analysis real	No-Build	et Off & On Ramp I 2040
Project Description SW 10th					
Oper.(LOS)			Des.(N)	Pla	inning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D	5690	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain:	0.95 3 0 Level	
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	mi	
Calculate Flow Adjustme	ents				
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		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 N	leasures		Design (N)		
<u>Operational (LOS)</u> v _p = (V or DDHV) / (PHF x N x [·]	f x f) 2026	pc/h/ln	<u>Design (N)</u> Design LOS		
S	62.1	mph	$v_p = (V \text{ or DDHV}) / (PHF x N x)$	f _{HV} x f _p)	pc/h/ln
5 D = v _p / S	32.6	pc/mi/ln	S		mph
LOS	D	pornan	D = v _p / S Required Number of Lanes, N		pc/mi/ln
Glossary			Factor Location		
v _p - Flow rate	S - Speed D - Density FFS - Free-flow BFFS - Base fre	-	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11
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		RAI	MPS AND	RAMP JUN	CTIONS W	ORKSHE	ET			
Genera	l Infori	nation			Site Infor	mation				
nalyst				Fr	eeway/Dir of Tra	avel I-	95 SB			
gency or C	Company	AECO	MC	Ju	nction	S	Seg 8-Merge fro	m 10th St		
ate Perfor					risdiction					
nalysis Tin		PM		Ar	nalysis Year	N	lo-Build 2040			
	scription	SW 10th Stree	t SIMR							
nputs									1	
pstream A	Adj Ramp			per of Lanes, N	3				Downstre	eam Adj
✓ Yes	On		Ramp Number		1				Ramp	
165			Acceleration L	ane Length, L _A	1470				🗆 Yes	On
No	✓ Off		Deceleration L	ane Length L _D					✓ No	Off
			Freeway Volur	ne, V _F	5690					
up =	2210 f	ť	Ramp Volume	, V _R	1560				L _{down} =	ft
			Freeway Free-	Flow Speed, S _{FF}	70.0				V _	· · · · le /le
'u =	1500 v	eh/h	Ramp Free-Flo		50.0				V _D =	veh/h
onver	sion tr	nc/h Und		Conditions						
		V	r r							
(pc/	n)	(Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PH	IF x f _{HV} x f _p
reeway		5690	0.95	Level	3	0	0.985	1.00		6079
Ramp		1560	0.92	Level	2	0	0.990	1.00		1713
JpStream		1500	0.92	Level	2	0	0.990	1.00		1647
00000000000000000000000000000000000000	am									
			Merge Areas					Diverge Areas		
stimat	tion of	v ₁₂				Estimatio	on of v_{12}			
		V ₁₂ = V _F	(P _{FM})				V =	= V _R + (V _F - V _R)P	
_{EQ} =		2533.17	(Equation	13-6 or 13-7)			• 12	(Equation 13-		12)
-~ FM =		0.598	using Equati	on (Exhibit 13-6)		L _{EQ} = P -				-
12 ⁼		3636		,		P _{FD} =		using Equation		13-7)
				on 13-14 or 13-		V ₁₂ =		pc/h		(-)
$_3$ or V $_{\rm av34}$		17)	· · · · ·			V ₃ or V _{av34}		pc/h (Equation '		·17)
s V_3 or V_{av}	_{v34} > 2,700) pc/h? 📃 Ye	s 🗹 No					Yes No		
s V_3 or V_{av}	_{v34} > 1.5 *	V ₁₂ /2 Ve	s 🗌 No			Is V_3 or V_{av34}	> 1.5 * V ₁₂ /2	Yes No		
Yes,V _{12a}		3636	pc/h (Equatio	on 13-16, 13-		lf Yes,V _{12a} =		pc/h (Equatio 13-19)	on 13-16, ⁻	13-18, or
.24		18, or	13-19)			0		10 10)		
Capacit	ty Che		1 0		1 00 50	Capacity	r -		.,	
		Actual	Ci	apacity	LOS F?		Actua		pacity	LOS F?
						V _F		Exhibit 13-	_	
V _F	0	7792	Exhibit 13-8		Yes	$V_{FO} = V_{F}$ -	V _R	Exhibit 13-		
						V _R		Exhibit 13	i -	
	ntorino	Morgo In	fluonoo A	<u></u>			oring Div	10		
IUW EI	litering	Actual	fluence A	rea Desirable	Violation?	riow Ent	Actual	erge Influer Max Des		Violation?
V _{R1}		5349	Exhibit 13-8	4600:All	Yes	V ₁₂	Actual	Exhibit 13-8		violation?
					165		Corrigo D		n (if no	<u> </u>
			nination (i	1				eterminatio		<i>()</i>
			0.0078 V ₁₂ - 0.0	UOZI LA				0.0086 V ₁₂ - 0	.009 L _D	
	7.2 (pc/mi						:/mi/ln)			
	Exhibit 1					LOS = (Ex	khibit 13-2)			
Speed I	Detern	nination				Speed De	eterminati	ion		
l _s = 0	.995 (Exib	it 13-11)				D _s = (Exl	hibit 13-12)			
-	•	Exhibit 13-11)					h (Exhibit 13-12	<u>2)</u>		
		Exhibit 13-11)					h (Exhibit 13-12			
υ Ο.	• •	,				-	•			
	.7.0 mnh (I	Exhibit 13-13)				S= moh	h (Exhibit 13-13	3)		

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 No-Build	et 10th & Exit to Exp 2040
Project Description SW 10th	n Street SIMR				
Oper.(LOS)			Des.(N)	Pla	nning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D	7250	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain:	0.95 3 0 Level	
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	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	\$	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f _{LW}		mph
Number of Lanes, N	3		f _{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			
LOS and Performance	Measures		Design (N)		
<u>Operational (LOS)</u> v _p = (V or DDHV) / (PHF x N > S D = v _p / S LOS	(f _{HV} x f _p) 2582 47.8 54.0 F	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 $D = v_p / S$	f _{HV} x f _p)	pc/h/ln mph pc/mi/ln
Glossary			Required Number of Lanes, N Factor Location		
-					
N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base fre	-	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

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		RAMP	S AND RAM	P JUNCTI	ONS WO	RKS	HEET			
General Info	rmation			Site Infor	mation					
Analyst			Fre	eeway/Dir of Tr	avel	I-95 SE	}			
Agency or Company	y AEC	OM		nction		Seg 10	- Diverge t	o Express		
Date Performed				risdiction			1.0040			
Analysis Time Perio			An	alysis Year		No-Bui	ld 2040			
Project Description	SW IUII SIIEE									
		Eroowov Num	ber of Lanes, N	3						
Upstream Adj F	Ramp	Ramp Numbe		5 1					Downstrea Ramp	m Adj
✓ Yes	✓ On		ane Length, L_{Δ}	I					Yes	On
No [Off		ane Length L _D	300						
		Freeway Volu	me, V _F	7250					✓ No	Off
L _{up} = 60	000 ft	Ramp Volume	e, V _R	770					L _{down} =	ft
V ₁₁ = 15	560 veh/h	-	-Flow Speed, S _{FF}	70.0					V _D =	veh/h
~			ow Speed, S _{FR}	45.0					D	
Conversion t		<u>der Base (</u>	Conditions							
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv		f _{HV}	f _p	v = V/PHF	x f _{HV} x f _p
Freeway	7250	0.95	Level	3	0	0.	985	1.00	774	16
Ramp	770	0.92	Level	2	0	0.	990	1.00	84	5
UpStream	1560	0.92	Level	2	0	0.	990	1.00	171	3
DownStream										
Estimation o		Merge Areas			Estimat	iono		Diverge Areas		
					LSUMAL					
	$V_{12} = V_{F}$	(P _{FM})					V ₁₂ =	: V _R + (V _F - V _F	_R)P _{FD}	
- _{EQ} =	(Equa	ation 13-6 or	13-7)		L _{EQ} =		92	262.56 (Equati	on 13-12 or	[.] 13-13)
P _{FM} =	using	Equation (E	Exhibit 13-6)		P _{FD} =		0.	527 using Equ	uation (Exhib	oit 13-7)
/ ₁₂ =	pc/h				V ₁₂ =		44	185 pc/h		
V_3 or V_{av34}	pc/h (Equation 13	-14 or 13-17)		V_3 or V_{av34}		32	261 pc/h (Equ	ation 13-14	or 13-17
ls V ₃ or V _{av34} > 2,7			,			₃₄ > 2,7		Yes No		
Is V_3 or $V_{av34} > 1.5$								Yes 🗹 No		
			-16, 13-18, or)46 pc/h (Equ	ation 13-16	. 13-18.
f Yes,V _{12a} =	13-19)		-,, -		If Yes,V _{12a} =	=		r 13-19)		,,
Capacity Che	ecks				Capacit	y Ch	ecks			
	Actual	С	apacity	LOS F?			Actual	Ca	pacity	LOS F
					V _F		7746	Exhibit 13-8	7200	Yes
V _{FO}		Exhibit 13-8			V _{FO} = V _F	- V _R	6901	Exhibit 13-8	7200	No
					V _R		845	Exhibit 13-1	2100	No
	g Merge In	fluence A	rea		Flow En	nterin	g Dive	rge Influen	ce Area	
-Iow Enterin		Max	Desirable	Violation?			Actual	Max Desirab	le	Violation
	Actual	+					485	Exhibit 13-8	4400:All	Yes
Flow Enterin	Actual	Exhibit 13-8			V ₁₂	4	405		1100.7 41	
V _{R12}			if not F)					terminatio		7)
V _{R12}	vice Detern	nination (,		Level of	f Serv	∕ice De		n (if not F)
V _{R12} Level of Serv D _R = 5.475 + 0	vice Detern 0.00734 v _R +	nination (,		Level of	f Serv	/ice De .252 + 0	terminatio	n (if not F)
V _{R12} _evel of Serv D _R = 5.475 + 0 D _R = (pc/mi/lr	vice Detern 0.00734 v _R + + n)	nination (,		Level of D _R = 47	f Ser D _R = 4 7.1 (pc.	/ice De .252 + 0	terminatio	n (if not F	5)
V_{R12} Level of Serv $D_R = 5.475 + 0$ $D_R = (pc/mi/lr$ OS = (Exhibit)	vice Detern 0.00734 v _R + 1 n) 13-2)	nination (,		Level of D _R = 47	f Ser D _R = 4 7.1 (pc. (Exhit	/ice De I.252 + 0 /mi/ln) bit 13-2)	terminatio .0086 V ₁₂ - 0.	n (if not F	5)
Level of Serv D _R = 5.475 + 0 D _R = (pc/mi/lr LOS = (Exhibit Speed Deterv	vice Detern 0.00734 v _R + 1 n) 13-2) mination	nination (,		Level of D _R = 47 LOS = F Speed L	f Serv D _R = 4 7.1 (pc. (Exhite Deter	/ice De I.252 + 0 /mi/ln) bit 13-2)	<i>terminatio</i> .0086 V ₁₂ - 0. On	n (if not F	7
V_{R12} Level of Serve $D_R = 5.475 + 0$ $D_R = (pc/mi/lr .OS = (Exhibit) Speed Deterve M_S = (Exibit 1)$	vice Detern 0.00734 v _R + 1 n) 13-2) mination 13-11)	nination (,		Level of $D_R = 47$ LOS = F Speed L $D_s = 0.$	f Serv D _R = 4 7.1 (pc. (Exhik Deter 374 (E	/ice De I.252 + 0 /mi/ln) bit 13-2) minatic xhibit 13-	terminatio .0086 V ₁₂ - 0. Dn -12)	n (if not F	5)
V_{R12} $D_R = 5.475 + 0$ $D_R = (pc/mi/lr$ OS = (Exhibit) Speed Detern $M_S = (Exibit 1)$ $S_R = mph (Exhibit)$	vice Detern 0.00734 v _R + 1 13-2) mination 13-11) hibit 13-11)	nination (,		Level of $D_R = 47$ LOS = F Speed L $D_s = 0.$ $S_R = 59$	f Serv D _R = 4 7.1 (pc. (Exhit Deter 374 (E 9.5 mph	/ice De I.252 + 0 /mi/ln) bit 13-2) minatic xhibit 13- (Exhibit	terminatio .0086 V ₁₂ - 0. 0 -12) 13-12)	n (if not F	5)
V_{R12} $D_{R} = 5.475 + 0$ $D_{R} = (pc/mi/lr$ $COS = (Exhibit)$ $Speed Detern$ $M_{S} = (Exibit 1)$ $S_{R} = mph (Exibit 2)$ $S_{0} = mph (Exib)$	vice Detern 0.00734 v _R + 1 n) 13-2) mination 13-11)	nination (,		Level of $D_R = 47$ $LOS = F$ Speed L $D_s = 0$. $S_R = 59$ $S_0 = 71$	f Serv D _R = 4 7.1 (pc (Exhit Deter 374 (E 9.5 mph 1.1 mph	/ice De I.252 + 0 /mi/ln) bit 13-2) minatic xhibit 13-	terminatio .0086 V ₁₂ - 0. 0 n -12) 13-12) 13-12)	n (if not F	=)

General Information			Site Information		
Analyst			Highway/Direction of Travel	I-95 SB	
Agency or Company	AECOM		From/To		Off Exp Off
Date Performed Analysis Time Period	PM		Jurisdiction Analysis Year	No-Build 20	040
Project Description SW 10th	n Street SIMR				
✓ Oper.(LOS)			Des.(N)	Plann	ing Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D	6480	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	
		VCII/II	Up/Down %		
Calculate Flow Adjustn	nents		·		
f _p	1.00		E _R	1.2	
'ρ Ε _Τ	1.5		^L -R f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.985	
	1.5				
Speed Inputs			Calc Speed Adj and FFS	>	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f _{LW}		mph
Number of Lanes, N	3		f _{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			
LOS and Performance	Measures		Design (N)		
<u>Operational (LOS)</u> v _p = (V or DDHV) / (PHF x N > S D = v _p / S LOS	(f _{HV} x f _p) 2308 55.8 41.4 E	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	-	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 f T	_{LW} - Exhibit 11-8 _{LC} - Exhibit 11-9 TRD - Page 11-11

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HCS 2010TM Version 6.90

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A			5 AND RAM	P JUNCTI		ORKS	HEET			
General Info	ormation			Site Infor						
Analyst		014		eeway/Dir of Tr	avel	I-95 SB				
Agency or Compar Date Performed	ny AEC	OM		nction risdiction		Seg 12	- Diverge t	o Sample Rd		
Analysis Time Peri	iod PM			alysis Year		No-Buil	d 2040			
Project Description		t SIMR	7.4			NO-Dui	u 20 1 0			
nputs										
	Domp	Freeway Num	ber of Lanes, N	3					Downotro	am Adi
Upstream Adj	Ramp	Ramp Numbe		1					Downstrea Ramp	am Adj
🗹 Yes	On		ane Length, L_{Δ}	I					•	
			- //	050					🗌 Yes	🗌 On
No	✓ Off		ane Length L _D	250					✓ No	Off
		Freeway Volu	1	6480						£
L _{up} = 2	2000 ft	Ramp Volume	e, V _R	1310					L _{down} =	ft
\/	770	Freeway Free	-Flow Speed, S _{FF}	70.0					V _D =	veh/h
$V_u = 7$	770 veh/h	Ramp Free-Fl	ow Speed, S _{FR}	45.0					*D	VCII/II
Conversion	to pc/h Une	der Base	Conditions							
	V	PHF	Terrain	%Truck	%Rv		f	f	v = V/PHF	vf vf
(pc/h)	(Veh/hr)	РПГ	Terrain	% ITUCK	7017.V	_	f _{HV}	f _p	v – v/FTH	^ 'HV ^ 'p
reeway	6480	0.95	Level	3	0	0.	985	1.00	69	23
Ramp	1310	0.92	Level	2	0	0.	990	1.00	14	38
JpStream	770	0.92	Level	2	0	0.	990	1.00		45
DownStream										
- 41		Merge Areas			F atimat			Diverge Areas		
stimation o	of V ₁₂				Estimat	ion o	τν ₁₂			
	V ₁₂ = V _F	(P _{FM})					V ₁₂ =	= V _R + (V _F - V _F	_R)P _{FD}	
_{EQ} =	(Equa	ation 13-6 or	13-7)		L _{EQ} =		(Equation 13-1	2 or 13-13)
FM =	using	Equation (E	Exhibit 13-6)		P _{FD} =		0.	521 using Equ	uation (Exhi	bit 13-7)
/ ₁₂ =	pc/h		,		V ₁₂ =			294 pc/h	,	,
V_3 or V_{av34}	-	Equation 13	-14 or 13-17)		V_3^{12} or V_{av34}^{12}			629 pc/h (Equ	ation 13-14	1 or 13-17
	P 0/11 (> 2 7		⊇Yes ☑No		
	700 pc/h? 🗆 🗸 🗠				Is V _a or V					
s V ₃ or V _{av34} > 2,7										
s V ₃ or V _{av34} > 2,7 s V ₃ or V _{av34} > 1.5	5 * V ₁₂ /2 🗌 Ye	s 🗌 No	-16 13-18 or		Is V_3 or V_{av}	, ₃₄ > 1.5	* V ₁₂ /2	Yes 🗹 No	13-16 13	18 or 13
s V ₃ or V _{av34} > 2,7 s V ₃ or V _{av34} > 1.5	5 * V ₁₂ /2 🗌 Ye	s 🔲 No Equation 13	-16, 13-18, or			, ₃₄ > 1.5	* V ₁₂ /2 [F		13-16, 13	-18, or 13
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s V ₃ or V _{av34} > 2,7 s V ₃ or V _{av34} > 1.5 Yes,V _{12a} = Capacity Ch	5 * V ₁₂ /2 Ye pc/h (13-19) pecks Actual	s 🗌 No Equation 13	apacity	LOS F?	Is V_3 or V_{av} If Yes, V_{12a} = Capacit V_F $V_FO = V_F$ V_R	_{/34} > 1.5 = t y Cho ₌ - V _R	* V ₁₂ /2 [r 1 ecks Actual 6923 5485 1438	Yes No pc/h (Equation 9) Ca Exhibit 13-8 Exhibit 13-8 Exhibit 13-1	pacity 3 7200 3 7200 0 2100	LOS F No
s V ₃ or V _{av34} > 2,7 s V ₃ or V _{av34} > 1.5 Yes,V _{12a} = Capacity Ch V _{FO}	5*V ₁₂ /2 □Ye pc/h (13-19) necks Actual	s 🗌 No Equation 13	apacity		Is V_3 or V_{av} If Yes, V_{12a} = Capacit V_F $V_FO = V_F$ V_R	-34 > 1.5 = ty Cho = - V _R	* V ₁₂ /2 [F 1 ecks Actual 6923 5485 1438 g Dive	Yes No pc/h (Equation 9) Ca Exhibit 13-8 Exhibit 13-8 Exhibit 13-1 rge Influen	pacity 3 7200 3 7200 0 2100 Ce Area	LOS F No No
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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 13-E No-Build	Bet Off & On Ramps
Project Description SW 10t					
Oper.(LOS)			Des.(N)	Pla	nning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K	5170	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R	0.95 3 0	
Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	General Terrain: Grade % Length Up/Down %	Level mi	
Calculate Flow Adjustr	nents				
f _p	1.00		E _R	1.2	
E _T	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
Speed Inputs			Calc Speed Adj and FFS	6	
Lane Width Rt-Side Lat. Clearance		ft ft	f _{LW}		mph
Number of Lanes, N	3		f _{LC}		mph
Total Ramp Density, TRD	70.0	ramps/mi	TRD Adjustment		mph
FFS (measured) 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		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	-	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

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Genera	al Informati				NG WORKSHEET Site Information				
Analyst Agency/Company AECOM Date Performed Analysis Time Period PM			I		Freeway/Dir of Travel I-95 SB Weaving Segment Location Seg 14- Bet Samp Analysis Year No-Build 2040				le & Copan
Project De Inputs	scription SW 10t	h Street SIMR			•				
Weaving configurationOne-SidedWeaving number of lanes, N4Weaving segment length, Ls1650ftFreeway free-flow speed, FFS70 mph					Freeway minimum speed, S _{MIN}				Free 2 L
Conve	rsions to po	c/h Under	Base Co	ondition	S				
	V (veh/h)	PHF	Truck (%)	RV (%)	E _T	E _R	f _{HV}	fp	v (pc/ł
V _{FF}	4430	0.95	3	0	1.5	1.2	0.985	1.00	4733
V _{RF}	1580	0.92	2	0	1.5	1.2	0.990	1.00	1735
V _{FR}	740	0.92	2	0	1.5	1.2	0.990	1.00	812
V _{RR}	0	0.95	0	0	1.5	1.2	1.000	1.00	0
V _{NW}	4733					-		V =	7280
V _w	2547							-	
VR	0.350								
Config	uration Cha	aracterist	ics		-				
Minimum maneuver lanes, N _{WL} 2 Ic					Minimum weaving lane changes, LC _{MIN}				
Interchange density, ID				0.7 int/mi	Weaving lane changes, LC_w				
Minimum RF lane changes, LC _{RF}				1 lc/pc	Non-weaving lane changes, LC_{NW}				
Minimum FR lane changes, LC _{FR} 1 Ic/				1 lc/pc	Total lane changes, LC _{ALL}				
Minimum RR lane changes, LC _{RR} lc/pc					Non-weaving vehicle index, I _{NW}				
Weavir	ng Segment	t Speed, I	Density, I	Level of	Service,	and Ca	oacity		
Weaving segment flow rate, v7185 veh/hWeaving segment capacity, c6758 veh/h				Weaving intensity factor, W Weaving segment speed, S					
Weaving segment v/c ratio 1.063				Average weaving speed, S _w					
Weaving segment density, D pc/mi/ln Level of Service, LOS F					Average non-weaving speed, S_{NW} Maximum weaving length, L_{MAX} 6				
	ervice, LUS			F	Maximum w	eaving lengtl	n, L _{MAX}		61
Chapter 13	segments longer tl , "Freeway Merge a	and Diverge Seg	gments".	-		solated merge	and diverge ar	eas using the	procedures
b. For volur	mes that exceed the	e weaving segm	ient capacity, t	he level of sei	rvice is "F".				

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