		F	REEWAY	( WEAV	ING WOF	RKSHEE	Г				
Genera	Informatio	on			Site Information						
Analyst Agency/Con Date Perfori Analysis Tin	npany ned ne Period	AECON AM	Λ		Freeway/Dir Weaving Seg Analysis Yea	Freeway/Dir of Travel I-95 NB Weaving Segment Location Seg 1-Bet Copans & Sample Analysis Year No-Build 2040					
Project Des	cription SW 10th	n Street SIMR			-						
Inputs					r						
Weaving co Weaving nu Weaving se Freeway fre	nfiguration mber of lanes, N gment length, L <sub>s</sub> e-flow speed, FF	S		One-Sided 4 1820ft 70 mph	Segment type Freeway minimum speed, S <sub>MIN</sub> Freeway maximum capacity, C <sub>IFL</sub> Terrain type						
Conver	sions to po	/h Unde	r Base Co	ondition	s		•		-		
	V (veh/h)	PHF	Truck (%)	RV (%)	Ε <sub>Τ</sub>	E <sub>R</sub>	f <sub>HV</sub>	fp	v (pc/h)		
V <sub>FF</sub>	4755	0.95	3	0	1.5	1.2	0.985	1.00	5080		
V <sub>RF</sub>	405	0.92	2	0	1.5	1.2	0.990	1.00	445		
V <sub>FR</sub>	970	0.92	2	0	1.5	1.2	0.990	1.00	1065		
V <sub>RR</sub>	0	0.95	0	0	1.5	1.2	1.000	1.00	0		
V <sub>NW</sub>	5080		•		-		-	V =	6590		
V <sub>w</sub>	1510							-			
VR	0.229										
Configu	ration Cha	racterist	ics		•						
Minimum m	aneuver lanes, N	N <sub>WL</sub>		2 lc	Minimum we	aving lane cl	nanges, LC <sub>MIN</sub>	I	1510 lc/h		
Interchange	density, ID			0.7 int/mi	Weaving lan	e changes, L	.C <sub>w</sub>		1882 lc/h		
Minimum R	F lane changes,	LC <sub>RF</sub>		1 lc/pc	Non-weaving	g lane chang	es, LC <sub>NW</sub>		1263 lc/h		
Minimum Fl	R lane changes,	LC <sub>FR</sub>		1 lc/pc	Total lane ch	nanges, LC <sub>ALI</sub>	L		3145 lc/h		
Minimum R	R lane changes,	$LC_{RR}$		lc/pc	Non-weaving	g vehicle inde	ex, I <sub>NW</sub>		647		
Weavin	g Segment	Speed,	Density, I	_evel of	Service,	and Cap	oacity				
Weaving se Weaving se	gment flow rate, gment capacity,	v c <sub>w</sub>		6500 veh/h 8548 veh/h	Weaving inte Weaving sec	ensity factor, gment speed	W , S		0.348 52.2 mph		
Weaving segment v/c ratio 0.70					Average wea	aving speed,	Sw		55.8 mph		
Weaving se	Weaving segment density, D 31.6 pc/mi					n Average non-weaving speed, S <sub>NW</sub>					
Level of Se	vice, LOS			D	Maximum we	eaving length	i, L <sub>max</sub>		4836 ft		
<b>Notes</b> a. Weaving s Chapter 13, ' b. For volume	egments longer th Freeway Merge a es that exceed the	nan the calcula nd Diverge Se weaving segr	ted maximum le gments". nent capacity, th	ength should l	be treated as is rvice is "F".	solated merge	and diverge ar	eas using the	procedures of		

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	BASIC F	REEWAY SE	GMENTS WORKSHEET		
0					
General Information			Site Information		
Analyst			Highway/Direction of Travel	1-95 NB	et Off & On from
Agency or Company	AECOM		From/To	Sample	
Date Performed Analysis Time Period	AM		Jurisdiction Analysis Year	No-Build	1 2040
Project Description SW 10	th Street SIMR				
✓ Oper.(LOS	)		Des.(N)	🗌 Pla	anning Data
Flow Inputs					
Volume, V	5160	veh/h	Peak-Hour Factor, PHF	0.95	
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	3	
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	0	
Peak-Hr Direction Prop, D			General Terrain:	Level	
DDHV = AADT x K x D		veh/h	Grade % Length	ті	
Calculate Flow Adjust	ments				
f <sub>p</sub>	1.00		E <sub>R</sub>	1.2	
Ε <sub>T</sub>	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 <sub>LW</sub>		mph
Number of Lanes, N	3		f <sub>LC</sub>		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 <sub>p</sub> = (V or DDHV) / (PHF x N	x f <sub>HV</sub> x f <sub>p</sub> ) 1838	pc/h/ln	$v_{r} = (V \text{ or } DDHV) / (PHF x N x)$	f <sub>LN</sub> x f <sub>n</sub> )	pc/h/ln
S	65.3	mph	S S	πv p <sup>,</sup>	mph
$D = v_p / S$	28.2	pc/mi/ln	D = v / S		pc/mi/ln
LOS	D		Required Number of Lanes, N		portiunt
Glossarv			Factor Location		
N - Number of lanes	S - Sneed				
	D - Density		E <sub>R</sub> - Exhibits 11-10, 11-12		f <sub>LW</sub> - Exhibit 11-8
v - Flow rate	FFS - Free-flow	sneed	E <sub>T</sub> - Exhibits 11-10, 11-11, 11-	-13	f <sub>LC</sub> - Exhibit 11-9
p level of convico	REES Booo fr	opecu a flow spood	f <sub>p</sub> - Page 11-18		TRD - Page 11-11
DDHV - Directional design h	our volume	e-now speed	LOS, S, FFS, v <sub>p</sub> - Exhibits 11-	2, 11-3	

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RAMPS AND RAMP JUNCTIONS WORKSHEET											
General	Infori	nation			Site Infor	mation					
Analyst				Fr	eeway/Dir of Tra	avel	I-95 N	IB			
Agency or Co	mpany	AEC	MC	Ju	Inction		Seg 3	-On Ramp f	rom Sample		
Date Perform	ed			Ju	risdiction						
Analysis Time	e Period	AM		Ar	nalysis Year		No-Bı	uild 2040			
Project Descr	ription	SW 10th Stree	t SIMR								
Inputs			1							1	
Upstream Adj	j Ramp		Freeway Num	ber of Lanes, N	3					Downstrea	am Adj
			Ramp Numbe	r of Lanes, N	1					Ramp	
L Yes	∐ On		Acceleration L	ane Length, L <sub>A</sub>	500					✓ Yes	🗹 On
I√ No	Off		Deceleration I	_ane Length L <sub>D</sub>							
			Freeway Volu	me, V <sub>F</sub>	5160						
L <sub>up</sub> =	ft		Ramp Volume	, V <sub>D</sub>	1460					L <sub>down</sub> =	1950 ft
			Freeway Free	-Flow Speed, Speed	70.0						
V <sub>u</sub> =	veh/h		Ramp Free-Fl	ow Speed, S <sub>-5</sub>	50.0					V <sub>D</sub> =	920 veh/h
Convers	ion to	nc/h Un	der Base	Conditions	00.0						
CONVERS			I								
(pc/h)		(Veh/hr)	PHF	Terrain	%Truck	%Rv		† <sub>HV</sub>	f <sub>p</sub>	v = V/PHF	x f <sub>HV</sub> x f <sub>p</sub>
Freeway		5160	0.95	Level	3	0	(	0.985	1.00	5	513
Ramp		1460	0.92	Level	2	0	(	0.990	1.00	1	603
UpStream											
DownStream	1 I	920	0.92	Level	2	0	(	0.990	1.00	1	010
			Merge Areas						Diverge Areas		
Estimatio	Estimation of V <sub>12</sub>						ion	of v <sub>12</sub>			
$V_{12} = V_{F} (P_{FM})$								V =	V + (V - V)	)P	
L <sub>FO</sub> =		(Equa	ation 13-6 or	r 13-7)		_		<b>v</b> 12 <sup>-</sup>	<sup>V</sup> R ' ( <sup>V</sup> F <sup>-</sup> <sup>V</sup> R (Fauction 12	12 or 12 1	2)
		0.591	using Equat	ion (Exhibit 13-6)		EQ -			(Equalion 13-		3)
$V_{40} =$		3261	oc/h	()		FD -				on (Exhibit 13	)-/)
12		2252	oc/h (Equati	on 13-14 or 13-		V <sub>12</sub> =			pc/h		
V <sub>3</sub> or V <sub>av34</sub>		17)				V <sub>3</sub> or V <sub>av34</sub>			pc/h (Equation 1	13-14 or 13-1	7)
Is $V_3$ or $V_{av34}$	<sub>4</sub> > 2,700	) pc/h? 🗌 Ye	s 🗹 No			Is V <sub>3</sub> or V <sub>av</sub>	<sub>34</sub> > 2,	,700 pc/h? [	Yes No		
Is $V_3$ or $V_{av3^2}$	<sub>4</sub> > 1.5 *	V <sub>12</sub> /2 Ve	s 🗌 No			Is V <sub>3</sub> or V <sub>av</sub>	<sub>34</sub> > 1.	.5 * V <sub>12</sub> /2	Yes 🗌 No		
If Yes V =		3261	oc/h (Equati	on 13-16, 13-		If Yes,V <sub>12a</sub> =	=	1	pc/h (Equatio	n 13-16, 13	3-18, or
11 1 03, V 12a		18, or	13-19)			120		I.	5-19)		
Capacity	<u>Che</u>	cks				Capacit	y Cł	necks			
		Actual	C	apacity	LOS F?			Actual	Ca	pacity	LOS F?
						V <sub>F</sub>			Exhibit 13-	8	
V <sub>EO</sub>		7116	Exhibit 13-8		No	$V_{FO} = V_{F}$	$-V_R$		Exhibit 13-	8	
FU						V_			Exhibit 13	-	
						*R			10		
Flow Ent	tering	Merge In	fluence A	rea		Flow En	<u>iteri</u>	ng Dive	rge Influen	ice Area	
		Actual	Max	Desirable	Violation?		—	Actual	Max Des	irable	Violation?
V <sub>R12</sub>		4864	Exhibit 13-8	4600:All	Yes	V <sub>12</sub>			Exhibit 13-8		
Level of Service Determination (if not F) Level of Service Determination (if not F)						F)					
D <sub>R</sub> = 8	5.475 + (	0.00734 v <sub>R</sub> + (	0.0078 V <sub>12</sub> - 0.0	00627 L <sub>A</sub>			D <sub>R</sub> =	4.252 + 0	.0086 V <sub>12</sub> - 0	.009 L <sub>D</sub>	
D <sub>R</sub> = 39.	5 (pc/mi	/ln)				D <sub>R</sub> = (p	oc/mi/	/ln)			
LOS = E (I	Exhibit 1	3-2)				LOS = (E	Exhib	it 13-2)			
Speed D	etern	nination				Speed L	Dete	rminatio	on		
$M_0 = 0.7$	76 (Evib	it 13_11)				D <sub>s</sub> = (E	xhibit	13-12)			
S = 40	2 mob /	Turner (10-11)				S <sub>n</sub> = m	ph (Fy	(hibit 13-12)			
∼ <sub>R</sub> − 48.	з ттрп (I 7 ж. т. //					к S_= т	nh (⊑v	(hibit 13_12)			
⊃ <sub>0</sub> = 63. c - 50	/ mph (l						pri (L)	(hibit 12 12)			
p = 52.	ა mpn (I	⊏xnidit 13-13)				ວ= m	pu (Ex	(13-13) (13-13)			

	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst			Highway/Direction of Travel	1-95 NB	at On frame Damanta A
Agency or Company	AECOM		From/To	Seg 4-Be	et On from Sample &
Date Performed Analysis Time Period	AM		Jurisdiction Analysis Year	No-Build	2040
Project Description SW 10th	Street SIMR				
✓ Oper.(LOS)			Des.(N)	Pla	nning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K	6620	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub> %RVs, P <sub>R</sub>	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	ients				
f <sub>p</sub>	1.00		E <sub>R</sub>	1.2	
E <sub>T</sub>	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 <sub>LW</sub>		mph
Number of Lanes, N	3		f <sub>LC</sub>		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)		
<u>Operational (LOS)</u> v <sub>p</sub> = (V or DDHV) / (PHF x N x S D = v <sub>p</sub> / S LOS	f <sub>HV</sub> x f <sub>p</sub> ) 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 <sub>HV</sub> x f <sub>p</sub> )	pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service DDHV - Directional design hou	S - Speed D - Density FFS - Free-flow BFFS - Base fre ur volume	speed e-flow speed	E <sub>R</sub> - Exhibits 11-10, 11-12 E <sub>T</sub> - Exhibits 11-10, 11-11, 11- f <sub>p</sub> - Page 11-18 LOS, S, FFS, v <sub>p</sub> - Exhibits 11-	-13 2, 11-3	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-11

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RAMPS AND RAMP JUNCTIONS WORKSHEET											
General Info	rmation			Site Infor	mation						
Analyst Agency or Company Date Performed Analysis Time Perio	/ AEC	MC	Fr Ju Ju	reeway/Dir of Tra unction urisdiction nalysis Year	avel	I-95 N Seg 5 No-Bi	IB -On from Ex	¢ρ			
Project Description	SW 10th Stree	t SIMR	7.0			NO-DC					
Inputs											
Upstream Adj Ramp	)	Freeway Num	ber of Lanes, N	3					Downstrea	am Adj	
Yes O	n	Acceleration L	ane Length, L <sub>A</sub>	600					Ramp	🗌 On	
🗹 No 🗌 Of	ff	Deceleration I Freeway Volu	Lane Length L <sub>D</sub>	6620					🗌 No	✓ Off	
L <sub>up</sub> = ft		Ramp Volume	e, V <sub>R</sub>	920					L <sub>down</sub> =	5545 ft	
V <sub>u</sub> = veh/ł	ı	Freeway Free Ramp Free-Fl	-Flow Speed, S <sub>FF</sub> low Speed, S <sub>FR</sub>	70.0 50.0					V <sub>D</sub> =	1320 veh/h	
Conversion t	to pc/h Un	der Base	Conditions								
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv		f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF	x f <sub>HV</sub> x f <sub>p</sub>	
Freeway	6620	0.95	Level	3	0	C	).985	1.00	7	073	
Ramp	920	0.92	Level	2	0	0	).990	1.00	1	010	
UpStream	(000										
DownStream	1320	0.92 Marga Araga	Level	2	0	0	).990 <b>г</b>	1.00	1	449	
Estimation o	fv	werge Areas			Fstimat	ion	ofv	nverge Areas			
	V -V (P )						12				
$V_{12} = V_F (P_{FM})$							V <sub>12</sub> = '	V <sub>R</sub> + (V <sub>F</sub> - V <sub>R</sub>	)P <sub>FD</sub>		
L <sub>EQ</sub> =	8337.17	(Equation	13-6 or 13-7)		L <sub>EQ</sub> =		(	Equation 13-	12 or 13-1	3)	
P <sub>FM</sub> =	0.617	using Equat	tion (Exhibit 13-6)	)	P <sub>FD</sub> =		ı	using Equatio	on (Exhibit 13	3-7)	
V <sub>12</sub> =	4367	pc/h			V <sub>12</sub> =		I	oc/h	c/h		
V <sub>3</sub> or V <sub>av34</sub>	2706 17)	pc/h (Equati	on 13-14 or 13-		$V_3$ or $V_{av34}$	<b>~</b> 2	700 pc/b2 [	pc/h (Equation 1	3-14 or 13-1	7)	
Is $V_3$ or $V_{av34} > 2,70$	00 pc/h? 🗹 Ye	s ∐No			$15 V_3 OI V_{av}$	34 <sup>-</sup> 2,	5 * V /2 □				
Is $V_3$ or $V_{av34} > 1.5$ If Yes, $V_{125} =$	*V <sub>12</sub> /2 Ve 4373	s       No pc/h (Equati	on 13-16, 13-		lf Yes,V <sub>12a</sub> =	34 ~ 1. =	5 v <sub>12</sub> /2 [ [	□ res □ No oc/h (Equatio 3-19)	n 13-16, 1	3-18, or	
Canacity Ch	18, or	13-19)			Canaait		naka	,			
	Actual		`anaoitr		Capacit	y Ch	Actual	Car	a a aitr		
	Actual		apacity	LUGF?	V		Actual	Evhibit 13		LUGF?	
V <sub>FO</sub>	8083	Exhibit 13-8		Yes	V <sub>FO</sub> = V <sub>F</sub>	- V <sub>R</sub>		Exhibit 13-	8		
					V <sub>R</sub>			Exhibit 13 10	-		
Flow Enterin	g Merge In	fluence A	rea		Flow En	nterii	ng Dive	rge Influen	ice Area		
	Actual	Max	Desirable	Violation?		—	Actual	Max Desi	irable	Violation?	
V <sub>R12</sub>	5907	Exhibit 13-8	4600:All	Yes	V <sub>12</sub>			Exhibit 13-8			
Level of Service Determination (if not F)					Level of	f Ser	vice De	terminatio	n (if not	F)	
D <sub>R</sub> = 5.475 +	- 0.00734 v <sub>R</sub> + (	0.0078 V <sub>12</sub> - 0.	00627 L <sub>A</sub>			D <sub>R</sub> =	4.252 + 0	.0086 V <sub>12</sub> - 0	.009 L <sub>D</sub>		
D <sub>R</sub> = 47.3 (pc/r	ni/ln)				D <sub>R</sub> = (p	oc/mi/	íln)				
LOS = F (Exhibit	13-2)				LOS = (E	=xhibi	it 13-2)				
Speed Deter	mination				Speed L	Jete	rminatic	on			
M <sub>S</sub> = 1.695 (Ex	ibit 13-11)				D <sub>s</sub> = (E	Exhibit	13-12)				
S <sub>R</sub> = 22.5 mph	(Exhibit 13-11)				S <sub>R</sub> = m	ph (Ex	(hibit 13-12)				
S <sub>0</sub> = 64.0 mph	(Exhibit 13-11)				S <sub>0</sub> = m	ph (Ex	(hibit 13-12)				
S = 27.3 mph	(Exhibit 13-13)				S= m	ph (Ex	(hibit 13-13)				

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	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed	AECOM		Highway/Direction of Travel From/To Jurisdiction	I-95 NB Seg 6-Be	et Exp On & Off to 10th
Analysis Time Period	AM		Analysis Year	No-Build	2040
Project Description SW 10tr	Street SIMR				nning Data
		L_] L	Jes.(N)		nning Data
	7540		Deale Have Faster DHF	0.05	
	7540	ven/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub>	0.95 3	
Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	%RVs, P <sub>R</sub> General Terrain: Grade % Length Up/Down %	0 Level mi	
Calculate Flow Adjustn	nents				
f <sub>p</sub>	1.00		E <sub>R</sub>	1.2	
Έ <sub>Τ</sub>	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
Speed Inputs			Calc Speed Adj and FFS	6	
Lane Width Rt-Side Lat. Clearance	2	ft ft	f <sub>LW</sub>		mph
Total Ramp Density TRD	5	ramps/mi	'LC TRD Adjustment		mph
FFS (measured) Base free-flow Speed, BFFS	70.0	mph mph	FFS	70.0	mph
LOS and Performance	Measures		Design (N)		
<u>Operational (LOS)</u> v <sub>p</sub> = (V or DDHV) / (PHF x N > S D = v <sub>p</sub> / S LOS	( f <sub>HV</sub> x f <sub>p</sub> ) 2685 44.4 60.4 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 <sub>HV</sub> x f <sub>p</sub> )	pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base fre ur volume	speed e-flow speed	E <sub>R</sub> - Exhibits 11-10, 11-12 E <sub>T</sub> - Exhibits 11-10, 11-11, 11- f <sub>p</sub> - Page 11-18 LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2	13 2, 11-3	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-11

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RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Infor	rmation			Site Infor	mation					
Analyst			Fr	eeway/Dir of Tr	avel	I-95 NE	3			
Agency or Company	AEC	MC	Ju	nction		Seg 7-	Off Ramp	to 10th St		
Date Performed			Ju	risdiction		-				
Analysis Time Perio	d AM		Ar	alysis Year		No-Bui	ld 2040			
Project Description	SW 10th Stree	t SIMR								
Inputs		¥								
Upstream Adi F	Ramp	Freeway Num	nber of Lanes, N	3					Downstrea	m Adi
	- I <sup>-</sup>	Ramp Numbe	er of Lanes, N	1					Ramp	· <b>,</b>
Yes	On	Acceleration I	Lane Length, L						Vee	On
		Deceleration	lane length l	250					I res	V OII
I INO L	_] Off	Eroowov Volu		7540					🗌 No	Off
	ft		ine, v <sub>F</sub>	7540					. =	1370 ft
Lup –		Ramp volume	e, v <sub>R</sub>	1320					-down	
V = v	/eh/h	Freeway Free	e-Flow Speed, S <sub>FF</sub>	70.0					V <sub>D</sub> =	1660 veh/h
<sup>u</sup>		Ramp Free-F	low Speed, S <sub>FR</sub>	45.0						
Conversion t	to pc/h Und	der Base	Conditions							
(nc/h)	V	PHF	Terrain	%Truck	%Rv		f	f	v = V/PHF	x fx f
(poin)	(Veh/hr)		Torrain	7011001	/01 (V		·HV	р		HV Tp
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	19
UpStream										
DownStream	1660	0.92	Level	2	0	0.	990	1.00	182	22
<b>F</b> atimation of	Testimation of v						<b>.</b>	Diverge Areas		
Estimation of	sumation of v <sub>12</sub>				Estimati		<sup>or v</sup> 12			
V <sub>12</sub> = V <sub>F</sub> ( P <sub>FM</sub> )							V <sub>12</sub> =	= V <sub>R</sub> + (V <sub>F</sub> - V	/ <sub>R</sub> )P <sub>FD</sub>	
L <sub>E0</sub> =	$E_{ro} = (Equation 13-6 \text{ or } 13-7)$						(	Equation 13-	12 or 13-13)	
	usina	Equation (	Exhibit 13-6)				0	.492 usina Ec	uation (Exhib	oit 13-7)
	nc/h				$V_{40} =$		4	699 nc/h		
12 VorV	pc/h	Equation 12	(14  or  12 17)		V or V		2	257 po/h (Equ	untion 12 14	or 12 17)
$v_3 \text{ or } v_{av34}$	pc/n (i 00 ===/h0 □ ] (		-14 01 13-17)		$a_3$ $a_{av34}$	> 2 7	ں 1 24/مم 100		ualion 13-14	0113-17)
$15 v_3 \text{ or } v_{av34} > 2,70$		s 🗌 No			$ s V_a \text{ or } V_{av34} \rightarrow 2.700 \text{ points} = 100$					
Is $V_3$ or $V_{av34} > 1.5$	^ v <sub>12</sub> /2 UYes	s ∐No			Is $V_3$ or $V_{av34} > 1.5^{\circ} V_{12}/2$ Yes V No					
lf Yes,V <sub>12a</sub> =	pc/h ( 13_10)	Equation 13	3-16, 13-18, or		If Yes,V <sub>12a</sub> = 5356 pc/h (Equation 13-16, 13-18, or 13 19)					
Capacity Ch					Capacity Checks					
	Actual		Panaoit <i>u</i>							
	Actual			LUGF?	V		Actual	C		LUSF?
					V <sub>F</sub>		8056	Exhibit 13	-8 7200	Yes
V <sub>FO</sub>		Exhibit 13-8			$V_{FO} = V_{F}$	- V <sub>R</sub>	6607	Exhibit 13	-8 7200	No
					V <sub>R</sub>		1449	Exhibit 13-	10 2100	No
Flow Enterin	g Merge In	fluence A	Area	u	Flow En	terin	g Dive	rge Influer	nce Area	
	Actual	Max	Desirable	Violation?			Actual	Max Desira	able	Violation?
V <sub>R12</sub>		Exhibit 13-8			V <sub>12</sub>	4	4699	Exhibit 13-8	4400:All	Yes
Level of Serv	vice Detern	nination (	(if not F)		Level of	Ser	vice De	terminatio	n (if not F	=)
$D = 5475 \pm 0$	00734 v + 0000000000000000000000000000000000	0 0078 V	- 0.006271			D = 4	1 252 + (	0.0086 V = 0	0091	/
$D_{\rm R} = 3.473 + 0.00734 V_{\rm R} + 0.0076 V_{12} = 0.00027 L_{\rm A}$					D - 40	R	/	12 0		
$D_R = (pc/m/m)$	1)				0 <sub>R</sub> - 40	5.1 (pc	/ጠ/ጠ)			
LOS = (Exhibit	13-2)				LOS = F	(Exhit	oit 13-2)			
Speed Deteri	peed Determination					Deter	minatio	on		
M <sub>s</sub> = (Exibit 1	3-11)				D <sub>s</sub> = 0.4	428 (E	xhibit 13	-12)		
S <sub>p</sub> = mnh (Fxt	hibit 13-11)				S <sub>R</sub> = 58.0 mph (Exhibit 13-12)					
$S_{a} = mnh (Evt)$	hihit 13_11)				S₀= 70.2 mph (Exhibit 13-12)					
S = mnh (Ext	hibit 13-13)				S = 61.6  mph (Exhibit 13-13)					
		ighte Boossie -							Concratad: 5"	20/2010 10.00
yngni e zo to universi	ty of Florida, All R	agina neserveu			HCS2010	versio	n 6.90		Generaleu. 3/2	2/2013 10.00

	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed	AECOM		Highway/Direction of Travel From/To Jurisdiction	I-95 NB Seg 8-Be	et Off & On 10th St
Analysis Time Period	AM		Analysis Year	No-Build	2040
Project Description SW 10th	n Street SIMR				
Oper.(LOS)			Des.(N)	□Pla	inning Data
Flow inputs					
Volume, V AADT	6220	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub>	0.95 3	
Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	%RVs, P <sub>R</sub> General Terrain: Grade % Length Up/Down %	0 Level mi	
Calculate Flow Adjustm	nents				
f <sub>p</sub>	1.00		E <sub>R</sub>	1.2	
E <sub>T</sub>	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 <sub>LW</sub>		mph
Number of Lanes, N	3		f <sub>LC</sub>		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 <sub>p</sub> = (V or DDHV) / (PHF x N x S D = v <sub>p</sub> / S LOS	s f <sub>HV</sub> x f <sub>p</sub> ) 2215 58.0 38.2 E	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 <sub>HV</sub> x f <sub>p</sub> )	pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base fre ur volume	speed ee-flow speed	E <sub>R</sub> - Exhibits 11-10, 11-12 E <sub>T</sub> - Exhibits 11-10, 11-11, 11- f <sub>p</sub> - Page 11-18 LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2	-13 2, 11-3	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-11

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RAMPS AND RAMP JUNCTIONS WORKSHEET											
Genera	l Infor	mation			Site Infor	mation					
Analyst				Fr	eeway/Dir of Tra	avel	I-95 N	IB			
Agency or	Company	AEC	ОМ	Ju	Inction		Seg -(	On Ramp 10	th St EB & WB		
Date Perfor	rmed			Ju	irisdiction						
Analysis Ti	me Period	AM		Ar	nalysis Year		Νο-Βι	uild 2040			
Project Des	scription	SW 10th Stree	t SINK								
inputs				har of Lanca N							
Upstream A	Adj Ramp		Freeway Num	iber of Lanes, N	3					Downstrea	m Adj
Ves			Ramp Numbe	r of Lanes, N	1					Ramp	
165			Acceleration L	ane Length, L <sub>A</sub>	1345					🗌 Yes	On
🗌 No	✓ Off		Deceleration I	_ane Length L <sub>D</sub>						V No	□ Off
			Freeway Volu	me, V <sub>F</sub>	6220						
L <sub>up</sub> =	1370	ft	Ramp Volume	e, V <sub>R</sub>	1660					L <sub>down</sub> =	ft
L,			Freeway Free	-Flow Speed, S <sub>FF</sub>	70.0					V -	voh/h
V <sub>u</sub> =	1320 v	/eh/h	Ramp Free-Fl	ow Speed, S <sub>FR</sub>	50.0					v <sub>D</sub> –	ven/m
Conver	rsion to	o pc/h Un	der Base	Conditions							
(pc	/h)	V (Voh/hr)	PHF	Terrain	%Truck	%Rv		f <sub>HV</sub>	f <sub>n</sub>	v = V/PHF	x f <sub>HV</sub> x f <sub>p</sub>
Freeway		(Ven/ni) 6220	0.95		3	0		1 985	1.00	66	×16
Ramn		1660	0.00	Level	2	0		1 990	1.00	18	202
UnStream		1320	0.02	Level	2	0		n 990	1.00	14	19
DownStrea	am	1020	0.52	Lovei	2	0			1.00	17	
			Merge Areas		<u>I</u>	Diverge Areas					
Estima	tion of	v <sub>12</sub>				Estimat	ion e	of v <sub>12</sub>			
	$V_{12} = V_F (P_{FM})$							\/ _ \	$I \pm 0 I = 0$		
L <sub>E0</sub> =	$L_{ro} = 2622.33$ (Equation 13-6 or 13-7)							v <sub>12</sub> – v	$v_{\rm R} + (v_{\rm F} - v_{\rm R})$	/ <sup>P</sup> FD	
		0 536	using Equat	ion (Exhibit 13-6)		EQ -		(	Equation 13-	12 OF 13-13	5)
$V_{40} =$		3563	nc/h	()		FD -		L	using Equatio	n (Exhibit 13-	·/)
		3083	pc/h (Equati	on 13-14 or 13-		V <sub>12</sub> =		þ	)C/h		
v <sub>3</sub> or v <sub>av34</sub>		17)				V <sub>3</sub> or V <sub>av34</sub>		 	oc/h (Equation 1	3-14 or 13-17	)
Is $V_3$ or $V_a$	<sub>v34</sub> > 2,70	0 pc/h? 🔽 Ye	s 🗌 No			Is V <sub>3</sub> or V <sub>av</sub>	<sub>34</sub> > 2,	700 pc/h?	∐Yes ∐No		
Is $V_3$ or $V_a$	<sub>v34</sub> > 1.5 *	V <sub>12</sub> /2 Ve	s 🗌 No			Is V <sub>3</sub> or V <sub>av</sub>	<sub>34</sub> > 1.	5 * V <sub>12</sub> /2	JYes ∐No	10 10 10	10
If Yes,V <sub>120</sub>	=	3946	pc/h (Equati	on 13-16, 13-		If Yes,V <sub>12a</sub> =	=	۴ 13	oc/h (Equatioi 3-19)	n 13-16, 13	-18, or
Canaci	ty Cho	18, or	13-19)			Canacit	v Ch	ocks	,		
Capaci	ly che	Actual		anacity			y ch	Actual	Car	acity	
<u> </u>		Actual	1 i	apacity	LUGT	V		Actual	Evhibit 13-8		20011
l						*F	V			, 	
V <sub>F</sub>	0	8468	Exhibit 13-8		Yes	V <sub>FO</sub> – V <sub>F</sub>	- v <sub>R</sub>		EXNIDIT 13-0	> 	
						V <sub>R</sub>			10	-	
Flow E	ntering	g Merge In	fluence A	rea		Flow En	terii	ng Diver	ge Influen	ce Area	
		Actual	Max	Desirable	Violation?			Actual	Max Desi	rable	Violation?
V <sub>R</sub>	12	5768	Exhibit 13-8	4600:All	Yes	V <sub>12</sub>			Exhibit 13-8		
Level of Service Determination (if not F)						Level of	<sup>r</sup> Ser	vice De	terminatio	n (if not l	F)
D <sub>R</sub>	= 5.475 +	0.00734 v <sub>R</sub> + (	0.0078 V <sub>12</sub> - 0.0	00627 L <sub>A</sub>			D <sub>R</sub> =	4.252 + 0.	0086 V <sub>12</sub> - 0.	009 L <sub>D</sub>	
D <sub>R</sub> = 4	1.2 (pc/m	i/ln)				D <sub>R</sub> = (p	oc/mi/	′ln)			
LOS = F	= (Exhibit ´	13-2)				LOS = (E	Exhibi	it 13-2)			
Speed	Speed Determination Speed Determination										
M <sub>S</sub> = 1	I.434 (Exit	oit 13-11)				D <sub>s</sub> = (E	xhibit	13-12)			
S <sub>R</sub> = 2	29.8 mph (	Exhibit 13-11)				S <sub>R</sub> = m	ph (Ex	(hibit 13-12)			
$S_0 = 6$	 61.1 mph (	Exhibit 13-11)				S <sub>0</sub> = m	ph (Ex	(hibit 13-12)			
s = 3	35.7 mph (	Exhibit 13-13)				S = m	ph (Ex	(hibit 13-13			

	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed	AECOM		Highway/Direction of Travel From/To Jurisdiction	l-95 NB Seg 10-l	Bet 10th St & Hillsboro
Analysis Time Period	AM		Analysis Year	No-Buila	1 2040
Project Description SW 10t	h Street SIMR				union Data
Elow Inputs	)		Jes.(N)		anning Data
	7000	· · · a la /la	Deals Hours Franker, DUF	0.05	
AADT	7880	ven/n veh/day	Yeak-Hour Factor, PHF       %Trucks and Buses, PT	0.95 3	
Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	%RVS, P <sub>R</sub> General Terrain: Grade % Length Up/Down %	0 Level mi	
Calculate Flow Adjustr	nents				
f <sub>p</sub>	1.00		E <sub>R</sub>	1.2	
Е <sub>т</sub>	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 <sub>⊥w</sub> f <sub>LC</sub> 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 <sub>p</sub> = (V or DDHV) / (PHF x N S D = v <sub>p</sub> / S LOS	x f <sub>HV</sub> x f <sub>p</sub> ) 2806 40.1 70.0 F	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 <sub>HV</sub> x f <sub>p</sub> )	pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base fre our volume	speed ee-flow speed	E <sub>R</sub> - Exhibits 11-10, 11-12 E <sub>T</sub> - Exhibits 11-10, 11-11, 11- f <sub>p</sub> - Page 11-18 LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2	-13 2, 11-3	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-11

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RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Info	rmation			Site Infor	mation					
Analyst			Fre	eeway/Dir of Tr	avel	I-95 NE	}			
Agency or Company	y AECO	ОМ	Ju	nction	:	Seg 11	-Off Ramp	Hillsboro EB		
Date Performed			Ju	risdiction		-				
Analysis Time Peric	d AM		An	alysis Year		No-Bui	ld 2040			
Project Description	SW 10th Stree	t SIMR								
Inputs		1								
Upstream Adi I	Ramp	Freeway Nun	nber of Lanes, N	3					Downstrea	m Adi
	- 1	Ramp Numbe	er of Lanes, N	1					Ramp	.,
I Yes □	✓ On	Acceleration	Lane Length, L							
		Deceleration	l ane l ength l	220						
	Off	Eroowov Volu		7000					🗹 No	Off
	0.95 #		ine, v <sub>F</sub>	7000					I. =	ft
L <sup>up</sup> - 3	005 11	Ramp volum	e, v <sub>R</sub>	800					-down	
V = 1	660 veh/h	Freeway Free	e-Flow Speed, S <sub>FF</sub>	70.0					V <sub>D</sub> =	veh/h
<sup>u</sup>		Ramp Free-F	low Speed, S <sub>FR</sub>	45.0					D	
Conversion	to pc/h Und	der Base	Conditions							
(nc/h)	V	PHF	Terrain	%Truck	%Rv		f	f	v = V/PHF	x fx f
(poin)	(Veh/hr)		Tontain	7011001	,01 (V		·HV	р		HV Y 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	8
UpStream	1660	0.92	Level	2	0	0.	990	1.00	182	22
DownStream Marga Argas										
Merge Areas					<b>F</b> otime of		l	liverge Areas		
Estimation o	sumation of v <sub>12</sub>				Estimati	on o	<sup>r v</sup> 12			
V <sub>12</sub> = V <sub>F</sub> ( P <sub>FM</sub> )						V <sub>12</sub> =	• V <sub>R</sub> + (V <sub>F</sub> - V	<sub>R</sub> )P <sub>FD</sub>		
L <sub>E0</sub> =	(Fquation 13-6  or  13-7)				L <sub>EO</sub> =		92	206.25 (Equat	ion 13-12 or	13-13)
	usina	Equation (	Exhibit 13-6)				0.	509 usina Ea	uation (Exhib	it 13-7)
	nc/h				V.0 =		4	/17 nc/h		
V or V	po/h	Equation 13	(14  or  12 17)		V. or V		3-	17 po/h (Equ	1314	or 13 17)
$v_3 \cup v_{av34}$	) pc/ii		-14 01 13-17)		$1^{\circ}$ $1^{\circ}$ $1^{\circ}$ $1^{\circ}$ $1^{\circ}$ $1^{\circ}$ $1^{\circ}$	<b>\</b> 27	00 nc/h2 T		1011 13-14	0115-17)
IS $v_3$ or $v_{av34} > 2,7$		s 🗌 No			$ s V_a \text{ or } V_{av34} \rightarrow 2.700 \text{ points} = 100$					
Is $V_3$ or $V_{av34} > 1.5$	^ v <sub>12</sub> /2 UYe	s ∐No			$V_3 \text{ or } V_{av34} > 1.5 \text{ v}_{12}/2 \text{ Ves } No$					
If Yes,V <sub>12a</sub> =	pc/n ( 13_19)	Equation 13	3-16, 13-18, or		If Yes, $V_{12a}$ = 5719 pc/h (Equation 13-16, 13-18, or 13-19)					
Canacity Ch					Canacity	v Ch	ocks	13-19)		
	Actual		) anaoit <i>u</i>		Capacity Cnecks					
	Actual			LUGF?	V		Actual			LUSF?
					V <sub>F</sub>		8419	Exhibit 13-	8 7200	Yes
V <sub>FO</sub>		Exhibit 13-8			$V_{FO} = V_{F}$	- V <sub>R</sub>	7541	Exhibit 13-	8 7200	Yes
					V <sub>R</sub>		878	Exhibit 13-1	10 2100	No
Flow Enterin	g Merge In	fluence A	Area	u	Flow En	terin	g Dive	rge Influen	ice Area	
	Actual	Max	Desirable	Violation?			Actual	Max Desira	ble	Violation?
V <sub>R12</sub>		Exhibit 13-8			V <sub>12</sub>	4	1717	Exhibit 13-8	4400:All	Yes
Level of Serv	vice Detern	nination (	(if not F)		Level of	Ser	vice De	terminatio	n (if not F	=)
$D = 5475 \pm 0$	0.00734 v + 1	0.0078.\/	- 0.006271			$rac{1}{2} = 4$	252 + 0	0086 V - 0	0091	/
$D_R = 5.475 \pm 0.00734 V_R \pm 0.0078 V_{12} = 0.00027 L_A$						- <sup>-</sup> R	/	.0000 12 0	.000 LD	
D <sub>R</sub> = (pc/m/m	(1)				0 <sub>R</sub> - 51	.5 (pc	((11/11))			
LOS = (Exhibit	13-2)				LOS = F	(Exhit	oit 13-2)			
Speed Deter	peed Determination					)eter	minatio	on		
M <sub>s</sub> = (Exibit 1	13-11)				D <sub>s</sub> = 0.377 (Exhibit 13-12)					
$S_p = mph (Fx)$	, hibit 13-11)				S <sub>R</sub> = 59.4 mph (Exhibit 13-12)					
$S_{a} = mnh (Ev)$	hihit 13_11)				$S_0 = 70.2 \text{ mph} (Exhibit 13-12)$					
S = mnh (Fx)	hibit 13-13)				S = 625  mph (Exhibit 13-13)					
		lighte Doopris d			10000010TM			10 10/	Concreted: El	02/2010 44.44
yngni e zo to univers	ity of Florida, All R	agina neserveu			HCS2010	versio	n 6.90		Generaleu. 3/2	.212013 11.40

	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed	AECOM		Highway/Direction of Travel From/To Jurisdiction	l-95 NB Seg 12-l	Bet Off & On Hillsboro
Analysis Time Period	AM		Analysis Year	No-Buila	1 2040
Project Description SW 10t	h Street SIMR				
✓ Oper.(LOS)			Des.(N)	Pla	inning Data
Flow Inputs					
Volume, V AADT	7080	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub>	0.95 3	
Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	%RVs, P <sub>R</sub> General Terrain: Grade % Length Up/Down %	0 Level mi	
Calculate Flow Adjustr	nents				
f <sub>p</sub>	1.00		E <sub>R</sub>	1.2	
Ε <sub>T</sub>	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	£		mah
RI-Side Lat. Clearance	3	п	LW f		mph
Total Ramp Density TRD	5	ramns/mi	'LC TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph		10.0	
LOS and Performance	Measures		Design (N)		
<u>Operational (LOS)</u> v <sub>p</sub> = (V or DDHV) / (PHF x N S D = v <sub>p</sub> / S LOS	x f <sub>HV</sub> x f <sub>p</sub> ) 2521 49.8 50.7 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 <sub>HV</sub> x f <sub>p</sub> )	pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base freeur volume	speed ee-flow speed	E <sub>R</sub> - Exhibits 11-10, 11-12 E <sub>T</sub> - Exhibits 11-10, 11-11, 11- f <sub>p</sub> - Page 11-18 LOS, S, FFS, v <sub>p</sub> - Exhibits 11-	-13 2, 11-3	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-11

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		F	REEWA	( WEAV	ING WOF	RKSHEE	Т		
Genera	I Informati	on			Site Info	rmation			
Analyst Agency/Co Date Perfo Analysis Ti	mpany rmed me Period	AECO AM	М		Freeway/Dir of Travel I-95 NB Weaving Segment Location Seg 13-Bet On & Off Hillsbo Analysis Year No-Build 2040				)ff Hillsboro
Project Des	scription SW 10t	h Street SIMF	2		-				
Inputs					•				
Weaving configurationOne-SidedWeaving number of lanes, N4Weaving segment length, Ls790ftFreeway free-flow speed, FFS70 mph					Segment type Free Freeway minimum speed, S <sub>MIN</sub> Freeway maximum capacity, C <sub>IFL</sub> 2 Terrain type L				Freewa 1 240 Leve
Conver	sions to p	<u>c/h Unde</u>	r Base Co	ondition	S				
	V (veh/h)	PHF	Truck (%)	RV (%)	Ε <sub>Τ</sub>	E <sub>R</sub>	f <sub>HV</sub>	fp	v (pc/h)
V <sub>FF</sub>	6430	0.95	3	0	1.5	1.2	0.985	1.00	6870
V <sub>RF</sub>	660	0.92	2	0	1.5	1.2	0.990	1.00	725
V <sub>FR</sub>	650	0.92	2	0	1.5	1.2	0.990	1.00	714
V <sub>RR</sub>	0	0.95	2	0	1.5	1.2	0.990	1.00	0
V <sub>NW</sub>	6870							V =	8309
V <sub>w</sub>	1439								
VR	0.173								
Config	uration Cha	aracteris	tics						
Minimum r	naneuver lanes,	N <sub>WI</sub>		2 lc	Minimum weaving lane changes, LC <sub>MIN</sub> 14				1439 lc/h
Interchang	e density, ID			0.7 int/mi	Weaving lane changes, LC <sub>w</sub>				1650 lc/h
Minimum F	RF lane changes	, LC <sub>RF</sub>		1 lc/pc	Non-weaving	g lane chang	es, LC <sub>NW</sub>		1073 lc/ł
Minimum F	R lane changes	, LC <sub>FR</sub>		1 lc/pc	Total lane ch	nanges, LC <sub>AL</sub>	L		2723 lc/h
Minimum F	RR lane changes	, LC <sub>RR</sub>		lc/pc	Non-weaving	g vehicle inde	ex, I <sub>NW</sub>		380
Weavin	ig Segmen	t Speed,	Density, I	Level of	Service,	and Cap	pacity		
Weaving s	egment flow rate	, V		8193 veh/h	Weaving inte	ensity factor,	W		0.600
Weaving segment capacity, c <sub>w</sub> 8410 veh/h					Weaving seg	gment speed	, S		49.6 mph
Weaving segment v/c ratio 0.974				Average weaving speed, $S_{W}$				49.4 mpł	
Weaving segment density, D 41.9 pc/mi/ln			Average non-weaving speed, $S_{_{NW}}$			49.7 mph			
Level of Se	ervice, LOS			E	Maximum weaving length, L <sub>MAX</sub> 4264 f				
Notes									
a. Weaving	segments longer t	han the calcula	ated maximum le	ength should I	be treated as is	solated merge	and diverge ar	eas using the	procedures of

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

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	BASIC F	REEWAY SE	GMENTS WORKSHEET			
General Information			Site Information			
Analyst Agency or Company Date Performed	AECOM		Highway/Direction of Travel From/To Jurisdiction	I-95 NB Seg 14-Bet Off & On Hillsbor		
Analysis Time Period	AM		Analysis Year	No-Buila	1 2040	
Project Description SW 10t	h Street SIMR					
✓ Oper.(LOS)			Des.(N)	Pla	anning Data	
Flow Inputs						
Volume, V AADT	7090	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub>	0.95 3		
Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	%RVs, P <sub>R</sub> General Terrain: Grade % Length Up/Down %	0 Level mi		
Calculate Flow Adjustr	nents					
f <sub>p</sub>	1.00		E <sub>R</sub>	1.2		
Έ <sub>τ</sub>	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985		
Speed Inputs			Calc Speed Adj and FFS	6		
Lane Width		ft				
Rt-Side Lat. Clearance	0	ft			mpn	
Number of Lanes, N	3				mpn	
	70.0	ramps/mi	TRD Adjustment		mpn	
FFS (measured)	70.0	mpn	FFS	70.0	mph	
Base free-flow Speed, BFFS		mpn				
LOS and Performance	Measures		Design (N)			
<u>Operational (LOS)</u> $v_p = (V \text{ or DDHV}) / (PHF x N)$ S D = $v_p / S$ LOS	x f <sub>HV</sub> x f <sub>p</sub> ) 2525 49.6 50.9 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 <sub>HV</sub> x f <sub>p</sub> )	pc/h/ln mph pc/mi/ln	
Glossary			Factor Location			
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base free our volume	speed ee-flow speed	E <sub>R</sub> - Exhibits 11-10, 11-12 E <sub>T</sub> - Exhibits 11-10, 11-11, 11- f <sub>p</sub> - Page 11-18 LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2	-13 2, 11-3	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-11	

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		F	REEWA	Y WEAV	ING WOF	RKSHEE	Т		
Genera	I Informati	on			Site Info	rmation			
Analyst Agency/Cc Date Perfo Analysis Ti	mpany rmed me Period	AECON AM	Л		Freeway/Dir of Travel I-95 NB Weaving Segment Location Seg 15-Bet On & Off to Exp Analysis Year No-Build 2040				
Project De	scription SW 10t	h Street SIMF	R						
Inputs					1				
Weaving configurationTwo-SidedWeaving number of lanes, N3Weaving segment length, Ls4665ftFreeway free-flow speed, FFS70 mph					Segment type Freew Freeway minimum speed, S <sub>MIN</sub> Freeway maximum capacity, C <sub>IFL</sub> 24 Terrain type Le <sup>4</sup>				Freeway 11 2400 Leve
Convei	sions to p	c/h Unde	r Base Co	ondition	5		,	,	
	V (veh/h)	PHF	Truck (%)	RV (%)	Ε <sub>Τ</sub>	E <sub>R</sub>	f <sub>HV</sub>	fp	v (pc/h)
V <sub>FF</sub>	5525	0.95	3	0	1.5	1.2	0.985	1.00	5903
V <sub>RF</sub>	635	0.92	2	0	1.5	1.2	0.990	1.00	697
V <sub>FR</sub>	1565	0.92	2	0	1.5	1.2	0.990	1.00	1718
V <sub>RR</sub>	175	0.92	2	0	1.5	1.2	0.990	1.00	192
V <sub>NW</sub>	8318		•	-			-	V =	8510
V <sub>W</sub>	192							-	
VR	0.023								
Config	uration Cha	aracterist	tics						
Minimum r	naneuver lanes,	N <sub>WL</sub>		0 lc	Minimum weaving lane changes, LC <sub>MIN</sub> lc/h				
Interchang	e density, ID			0.7 int/mi	Weaving lan	e changes, L	.C <sub>w</sub>		lc/h
Minimum F	RF lane changes,	$\mathrm{LC}_{\mathrm{RF}}$		0 lc/pc	Non-weaving	g lane chang	es, LC <sub>NW</sub>		lc/h
Minimum F	R lane changes,	$LC_{FR}$		0 lc/pc	Total lane ch	nanges, LC <sub>AL</sub>	L		lc/h
Minimum F	RR lane changes	, LC <sub>RR</sub>		3 lc/pc	Non-weaving	g vehicle inde	ex, I <sub>NW</sub>		
Weavir	ig Segmen	t Speed,	Density,	Level of	Service,	and Cap	oacity		
Weaving s	egment flow rate	. V		8398 veh/h	Weaving inte	ensity factor,	W		
Weaving segment capacity, c <sub>w</sub> 6807 veh/h					Weaving seg	gment speed	, S		mph
Weaving segment v/c ratio 1.234					Average weaving speed, ${\rm S}_{\rm w}$				mph
Weaving segment density, D pc/mi/ln					Average non-weaving speed, $S_{_{\rm NW}}$				mph
Level of Se	ervice, LOS			F	Maximum weaving length, L <sub>MAX</sub> 5936 ft				
Notes									
a. Weaving	segments longer t	han the calcula	ted maximum le	ength should I	be treated as is	olated merge	and diverge are	eas using the	procedures of

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

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BASIC FREEWAY SEGMENTS WORKSHEET										
General Information			Site Information							
Analyst Agency or Company Date Performed	AECOM		Highway/Direction of Travel From/To Jurisdiction	l-95 NB Seg 16-l	North of Hillsboro					
Analysis Time Period	AM		Analysis Year	lysis Year No-Build 2040						
Project Description SW 10th	h STreet SIMR									
Oper.(LOS)			Des.(N)	🗌 Pla	nning Data					
Flow Inputs										
Volume, V AADT	6160	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub>	0.95 4						
Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	%RVs, P <sub>R</sub> General Terrain: Grade % Length Up/Down %	0 Level mi						
Calculate Flow Adjustn	nents									
f <sub>p</sub>	1.00		E <sub>R</sub>	1.2						
E <sub>T</sub>	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.980						
Speed Inputs			Calc Speed Adj and FFS	3						
Lane Width		ft								
Rt-Side Lat. Clearance		ft	f <sub>LW</sub>		mph					
Number of Lanes, N	3		T <sub>LC</sub>		mpn					
EES (moasured)	70.0	ramps/mi		70.0	mpn					
Rase free flow Speed BEES	70.0	mph	FFS	70.0	mpn					
		прп								
LOS and Performance	Measures		Design (N)							
<u>Operational (LOS)</u> v <sub>p</sub> = (V or DDHV) / (PHF x N x S D = v <sub>p</sub> / S LOS	x f <sub>HV</sub> x f <sub>p</sub> )2205 58.3 37.8 E	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 <sub>HV</sub> x f <sub>p</sub> )	pc/h/ln mph pc/mi/ln					
Glossary			Factor Location							
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base fre our volume	speed ee-flow speed	E <sub>R</sub> - Exhibits 11-10, 11-12 E <sub>T</sub> - Exhibits 11-10, 11-11, 11- f <sub>p</sub> - Page 11-18 LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2	13 2, 11-3	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-11					

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		F	REEWAY	WEAV	ING WOR	RKSHEE	Г			
General	Informatio	on			Site Info	rmation				
Analyst Agency/Con Date Perforr Analysis Tin	Analyst Agency/Company AECOM Date Performed Analysis Time Period PM				Freeway/Dir of Travel I-95 NB Weaving Segment Location Seg 1-Bet Copans & Sample Analysis Year No-Build 2040				& Sample	
Project Desc	cription SW 10th	Note SIMR			-					
Inputs					1					
Weaving configurationOne-SidedWeaving number of lanes, N4Weaving segment length, Ls1820ftFreeway free-flow speed, FFS70 mph					Segment type Freeway minimum speed, S <sub>MIN</sub> Freeway maximum capacity, C <sub>IFL</sub> Terrain type				Freeway 15 2400 Level	
Convers	sions to po	/h Under	r Base Co	ondition	S		1	Ĩ	-	
	V (veh/h)	PHF	Truck (%)	RV (%)	Ε <sub>Τ</sub>	E <sub>R</sub>	f <sub>HV</sub>	fp	v (pc/h)	
V <sub>FF</sub>	4770	0.95	3	0	1.5	1.2	0.985	1.00	5096	
V <sub>RF</sub>	480	0.92	2	0	1.5	1.2	0.990	1.00	527	
V <sub>FR</sub>	1810	0.92	2	0	1.5	1.2	0.990	1.00	1987	
V <sub>RR</sub>	0	0.95	0	0	1.5	1.2	1.000	1.00	0	
V <sub>NW</sub>	5096		-					V =	7610	
V <sub>W</sub>	2514							-		
VR	0.330									
Configu	ration Cha	racterist	ics		•					
Minimum m	aneuver lanes, N	I <sub>WL</sub>		2 lc	Minimum weaving lane changes, LC <sub>MIN</sub>				lc/h	
Interchange	density, ID			0.7 int/mi	Weaving lane changes, LC <sub>w</sub>					
Minimum R	F lane changes,	LC <sub>RF</sub>		1 lc/pc	Non-weaving	g lane chang	es, LC <sub>NW</sub>		lc/h	
Minimum F	R lane changes,	LC <sub>FR</sub>		1 lc/pc	Total lane ch	nanges, LC <sub>ALI</sub>	L		lc/h	
Minimum R	R lane changes,	LC <sub>RR</sub>		lc/pc	Non-weaving vehicle index, I <sub>NW</sub>					
Weavin	g Segment	Speed,	Density, I	_evel of	Service,	and Cap	oacity			
Weaving se Weaving se	gment flow rate, gment capacity,	v c <sub>w</sub>		7511 veh/h 7158 veh/h	Weaving inte Weaving seg	ensity factor, gment speed	W , S		mph	
Weaving segment v/c ratio 1.049					Average weaving speed, S <sub>w</sub> m				mph	
Weaving segment density, D pc/mi/ln				Average non-weaving speed, $S_{_{\rm NW}}$				mph		
Level of Service, LOS F					Maximum weaving length, L <sub>MAX</sub> 5912 ft					
<b>Notes</b> a. Weaving s Chapter 13, " b. For volume	egments longer th Freeway Merge a es that exceed the	an the calcula nd Diverge Se weaving segn	ted maximum le gments". nent capacity, th	ength should l	be treated as is	solated merge	and diverge ar	eas using the	procedures of	

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	BASIC F	REEWAY SE	GMENTS WORKSHEET				
Conoral Information			Site Information				
Analysi	450014			Seg 2-B	et Off & On from		
Agency of Company	AECOM		From/To	Sample			
Date Performed Analysis Time Period	PM		Jurisdiction Analysis Year	No-Build	1 2040		
Project Description SW 10	th Street SIMR						
Oper.(LOS	6)		Des.(N) Planning Data				
Flow Inputs							
Volume, V	5250	veh/h	Peak-Hour Factor, PHF	0.95			
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	3			
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	0			
Peak-Hr Direction Prop, D		veb/b	General Terrain:	Level			
		ven/n	Grade % Length	m			
Colouloto Flour Adiust							
Calculate Flow Adjust	ments						
f <sub>p</sub>	1.00		E <sub>R</sub>	1.2			
E <sub>T</sub>	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 <sub>LW</sub>		mph		
Number of Lanes, N	3		f <sub>LC</sub>		mph		
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph		
FFS (measured)	70.0	mph	FFS	70.0	mph		
Base free-flow Speed, BFFS	8	mph			·		
LOS and Performance	e Measures		Design (N)				
Operational (LOC)			Design (N)				
$\frac{\text{Operational}(LOS)}{(DUE : N)}$			Design LOS				
$v_p = (V \text{ or } DDHV) / (PHF X N)$	I x t <sub>HV</sub> x t <sub>p</sub> ) 1870	pc/h/ln	$v_{p} = (V \text{ or DDHV}) / (PHF x N x)$	f <sub>HV</sub> x f <sub>n</sub> )	pc/h/ln		
S	64.8	mph	S	p	mph		
$D = v_p / S$	28.9	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	40	T <sub>LW</sub> - Exnibit 11-8		
v <sub>n</sub> - Flow rate	FFS - Free-flow	speed	$E_{T}$ - Exhibits 11-10, 11-11, 11-	13	t <sub>LC</sub> - Exhibit 11-9		
LOS - Level of service	BFFS - Base fre	e-flow speed	t <sub>p</sub> - Page 11-18		TRD - Page 11-11		
DDHV - Directional design h	iour volume		LOS, S, FFS, v <sub>p</sub> - Exhibits 11-	2, 11-3			
S							

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✓ On				
☑ On □ Off				
I On ☐ Off				
Off				
4050 8				
1950 11				
770 veh/h				
F x f.,, x f				
HV A 'p				
5609				
1262				
845				
Diverge Areas				
13)				
2.7				
5-7)				
17)				
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				
3-18, or				
LOS F?				
1				
Violation?				
t F)				
Speed Determination				

General InformationAnalystHighway/Direction of TravelI-95 NBAgency or CompanyAECOMFrom/ToSeg 4-Bet GDate PerformedJurisdictionNo-Build 2CProject DescriptionSW 10th Street SIMRImage: Seg 4-Bet GImage: Strength of SW 10th Street SIMRImage: Seg 4-Bet GImage: Strength of SW 10th Street SIMRImage: Seg 4-Bet GImage: Strength of Street SimeSeg 4-Bet GImage: Street SimeImage: Seg 4-Bet G<		BASIC F	REEWAY SE	GMENTS WOR	RKSHEET		
Site InformationGeneral InformationSite InformationAnalystHighway/Direction of TravelI-95 NBAgency or Company $AECOM$ From/ToSeg 4-Bet GDate PerformedJurisdictionAnalysis YearNo-Build 2CProject DescriptionSW 10th Street SIMRImage: Seg 4-Bet GSeg 4-Bet G $\square$ Oper.(LOS)Des.(N)PlannFlow InputsVolume, V6400veh/hPeak-Hour Factor, PHE0.95AADTveh/day%Trucks and Buses, P <sub>T</sub> 3Peak-Hr Direction Prop, DGeneral Terrain:LevelDHV = AADT x K x Dveh/hGrade% LongthmiUp/Down %Calculate Flow Adjustmentsf1.2ff_p1.00E <sub>R</sub> 1.2f1.2E <sub>T</sub> 1.5f_hw = 10(1+P_x(E_T-1)+P_R(E_R-1))0.985Speed InputsCalc Speed Adj and FFSLane WidthftffKt-Side Lat, ClearanceftfFFSmphFFS70.0Base free-flow Speed, BFFSmphDesign (N)Operational (LOS)y_p = (V or DDHV) / (PHF x N x f_hV x f_p) 2279pc/h/lnS56.5mphSD = v_p / S40.3pc/m/lnCosEFactor LocationN - Number of IanesS - SpeedFactor LocationN - Number of IanesS - SpeedFactor LocationN - Number of IanesS - SpeedFactor LocationN - Number of Ianes <t< th=""><th></th><th></th><th></th><th></th><th></th><th></th><th></th></t<>							
AnalystHighway/Direction of Travel/-95 NBAgency or CompanyAECOMFrom/ToExpDate PerformedPMAnalysis YearNo-Bulld 2CAnalysis Time PeriodPMAnalysis YearNo-Bulld 2CProject DescriptionSW 10th Street SIMRDes.(N)PlannFlow InputsVolume, V6400veh/hPeak-Hour Factor, PHF0.95Volume, V6400veh/hPeak-Hour Factor, PHF0.95AADTveh/day% Trucks and Buses, PT3Peak-Hr Direction Prop. DGeneral Terrain:LevelDDHV = AADT x K x Dveh/hGrade% LengthDHV = AADT x K x Dveh/hGrade% LengthmiUp/Down %Up/Down %Up/Down %Up/Down %0.985Speed InputsCalc Speed Adj and FFS1.2Er1.2Lane Widthftft.ft.cTRD AdjustmentFFS (measured)70.0mphFFS70.0Base free-flow Speed, BFFSmphDesign (N)Design LOSOperational (LOS)yp = (V or DDHV) / (PHF x N x ft.v x fp.)SD = vp / SQuerational (LOS)FRequired Number of Lanes, NSQF0.0D = vp / SRequired Number of Lanes, NGlossaryFactor LocationFFSN - Number of IanesS - SpeedFSV - Hourly volumeD - DensityFFCalculate Stan, NGlossaryFactor LocationF </th <th>eneral Information</th> <th></th> <th></th> <th>Site Informat</th> <th>tion</th> <th></th> <th></th>	eneral Information			Site Informat	tion		
Agency or CompanyAECOMFrom/ToSeg 4-BetDate PerformedJurisdictionAnalysis The PeriodPMAnalysis The PeriodPMAnalysis The PeriodPMAnalysis The PeriodPMMapsis Time PeriodPMProject DescriptionSW 10th Street SIMRVolume, V6400Veh/hPeak-Hour Factor, PHF0.95AADTveh/dayVolume, V6400Veh/day%Trucks and Buses, PT33Peak-Hr Direction Prop, DGeneral Terrain:DDHV = AADT x K x Dveh/hGalculate Flow Adjustmentsfp1.00FT1.5fp1.00ET1.2ET1.5fp1.00ET1.2ET1.5frw1.12ET1.5frw1.12ET1.5fp1.00ET1.2ET1.5frw1.12ET1.5frw1.12Fr1.2ET1.5frw1.12Fr1.2Speed InputsCalc Speed Adj and FFSLane WidthftRt-Side Lat. ClearanceftfrftFS (measured)70.0mphFFSSpeed (LOS) $v_p \in (V or DDHV) / (PHF x N x f_{HV} x f_p) 2279p/h/lnSSpeed (LOS)v_p < (V or$	nalyst			Highway/Direction	on of Travel	1-95 NB	t On from Somalo P
Date Performed Analysis Time PeriodJurisdiction Analysis YearNo-Build 20Project DescriptionSW 10th Street SIMRAnalysis YearNo-Build 20Flow Inputs $\bigcirc$ Oper.(LOS)Des.(N)PlanniFlow InputsVolume, V6400veh/hPeak-Hour Factor, PHF0.95AADTveh/day% Trucks and Buses, P <sub>T</sub> 3Peak-Hr Direction Prop. DGeneral Terrain:LevelDDHY = AADT x K x Dveh/hGeneral Terrain:LevelDHY = AADT x K x Dveh/hGrade% LengthmlUp/Down %Calculate Flow Adjustments1.2F <sub>t</sub> 1.2F <sub>t</sub> 1.00E <sub>R</sub> 1.21.2E <sub>T</sub> 1.5f <sub>thV</sub> = 1/(1+P <sub>T</sub> (E <sub>T</sub> -1) + P <sub>R</sub> (E <sub>R</sub> -1)]0.985Speed InputsCalc Speed Adj and FFSLane WidthftftRt-Side Lat. Clearanceftft.wFFS (measured)70.0mphFFS (measured)70.0mphFFS (measured)70.0mphS56.5mphD = v <sub>p</sub> / S40.3pc/mi/nLOSESeign (N)Design (N)Design LOSS56.5mphD = v <sub>p</sub> / S40.3pc/mi/nCSEFactor LocationN - Number of IanesS - SpeedV - Hourly volumeD - DensityV <sub>p</sub> - Flow rateFFS - Sree-flow speedLOS - Level of serviceBFFS - Base free-flow speedLOS - Level of serviceBFFS - B	ency or Company	AECOM		From/To		Seg 4-Be	et On from Sample &
Project DescriptionSU 10th Street SIMR $\square$ Oper.(LOS) $\square$ Des.(N) $\square$ PlannFlow InputsVolume, V6400veh/hPeak-Hour Factor, PHF0.95AADTveh/day%Trucks and Buses, P <sub>T</sub> 3Peak-Hr Direction Prop, Dweh/hGeneral Terrain:LevelDDHV = AADT x K x Dveh/hGrade% LengthmiUp/Down %Calculate Flow Adjustments $f_p$ 1.00 $E_R$ 1.2 $f_p$ 1.00 $E_R$ 1.2 $E_{T}$ 1.5Speed InputsCalc Speed Adj and FFSLane Widthft $f_{LW}$ $f_{LW}$ Number of Lanes, N3Tamps/miTRD AdjustmentFFS (measured)70.0mphFS70.0Base free-flow Speed, BFFSmphDesign (N)Design (N)Operational (LOS) $\gamma_p$ = (V or DDHV) / (PHF x N x $f_{HV} x f_p$ ) 2279pc/h/inS56.5mphS $p = v_p / S$ Clos and Performance MeasuresDesign (N)Design LOS $V_p = (V or DDHV) / (PHF x N x f_{HV} x f_p) 2279pc/h/inS66.5mphSD = v_p / S40.3pc/mi/inS5SD = v_p / S40.3pc/mi/inClos Level of serviceFFS - Free-flow speedLOSLevel of serviceFFS - Free-flow speedLOSLevel of serviceBFFS - Base free-flow speedLOSLevel of serviceBFFS - Base free-flow sp$	ate Performed nalysis Time Period	PM		Jurisdiction Analysis Year		No-Build	2040
$\blacksquare$ Oper.(LOS) $\square$ Des.(N) $\square$ PlannFlow InputsVolume, V6400veh/hPeak-Hour Factor, PHF0.95AADTveh/day% Trucks and Buses, PT3Peak-Hr Direction Prop, D%RVs, PR0DDHV = AADT x K x Dveh/hGrade %LengthDHV = AADT x K x Dveh/hGrade %LengthmiUp/Down %Calculate Flow Adjustments $f_p$ 1.20ER1.2 $f_p$ 1.00ER $R_R$ 1.2ERET1.5 $f_{HV} = 1/(1+P_T(E_T-1) + P_R(E_R-1))$ 0.985Speed InputsCalc Speed Adj and FFSLane Widthftft.Rt-Side Lat. Clearanceftft.Number of Lanes, N3TCDA Ramp Density, TRDramps/miFFS (measured)70.0mphFFSBase free-flow Speed, BFFSmphDesign (N)Operational (LOS) $\gamma_p = (V \text{ or DDHV}) / (PHF x N x f_{HV} x f_p) 2279pc/h/inS56.5mphDesign LOS\gamma_p = (V \text{ or DDHV}) / (PHF x N x f_{HV} x f_p) 2279pc/h/inSD = v_p / S40.3pc/mi/inDesign LOS\gamma_p = (V \text{ or DDHV}) / (PHF x N x f_{HV} x f_p) 2279pc/h/inSD = v_p / S40.3pc/mi/inDClosEFactor LocationSD = v_p / SRequired Number of Lanes, NSGlossaryFactor LocationFactor LocationN - Number of lanesS - SpeedFactor $	oject Description SW 10th S	treet SIMR					
Flow InputsVolume, V6400veh/hPeak-Hour Factor, PHF0.95AADTveh/day%Trucks and Buses, P %Trucks and Buses, P General Terrain:3Peak-Hr Direction Prop, DGeneral Terrain:LevelDDHV = AADT x K x Dveh/hGeneral Terrain:LevelDHV = AADT x K x Dveh/hGrade% Lengthmi Up/Down %Calculate Flow Adjustments $f_p$ 1.00 $E_R$ 1.2 $E_T$ 1.5 $f_{HV}$ = 1/[1+P <sub>7</sub> (E <sub>T</sub> -1) + P <sub>R</sub> (E <sub>R</sub> -1)]0.985Speed InputsLane WidthftRt-Side Lat. Clearanceft $f_{LC}$ Total Ramp Density, TRDramps/miFFSFS (measured)70.0mphBase free-flow Speed, BFFSmphDesign (N)Operational (LOS) $v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p) 2279pc/hrlinSSS56.5mphSD = v_p / S40.3pc/mi/lnSSSSD = v_p / S40.3pc/mi/lnSSSClossaryFactor LocationN - Number of lanesS - SpeedV - Hourly volumeD - Densityv_p - Flow rateFFS - Free-flow speedLOS - Level of serviceBFFS - Base free-flow speedLO$	Oper.(LOS)			Des.(N)		Pla	nning Data
Volume, V6400veh/hPeak-Hour Factor, PHF0.95AADTveh/day%Trucks and Buses, $P_T$ 3Peak-Hr Prop. of AADT, K%RVS, $P_R$ 0Peak-Hr Direction Prop, DGeneral Terrain:LevelDDHV = AADT x K x Dveh/hGade % LengthmiUp/Down %Calculate Flow Adjustments $f_p$ 1.20 $f_p$ 1.00 $E_R$ 1.2 $E_T$ 1.5 $f_{HV} = 1/(1+P_T(E_T-1)+P_R(E_R-1))$ 0.985Speed InputsCalc Speed Adj and FFSLane Widthft $f_{LC}$ Number of Lanes, N3TRD AdjustmentFFS (measured)70.0mphBase free-flow Speed, BFFSmphLOS and Performance MeasuresDesign (N)Operational (LOS) $V_p = (V \text{ or DDHV}) / (PHF x N x f_{HV} x f_p) 2279$ pc/h/lnS56.5mphD = $v_p/S$ 40.3pc/mi/lnSSS $P_p < S$ LOSEFactor LocationN - Number of lanesS - SpeedV - Hourly volumeD - Density $v_p$ - Flow rateFFS - Free-flow speedLOS - Level of serviceBFFS - Base free-flow speedLOS - Level of serviceBFFS - Bas	ow Inputs						
Peak-Hr Dip, D AND 1, NJok VS, FRODek-Hr Direction Prop, DGeneral Terrain:LevelDDHV = AADT x K x Dveh/hGeneral Terrain:LevelCalculate Flow Adjustments $f_p$ 1.00ER1.2 $f_p$ 1.00ER1.21.2ET1.5 $f_{HV} = 1/[1+P_T(E_T+1)+P_R(E_R+1)]$ 0.985Speed InputsCalc Speed Adj and FFSLane WidthftRt-Side Lat. ClearanceftNumber of Lanes, N3Total Ramp Density, TRDramps/miFFS (measured)70.0Base free-flow Speed, BFFSmphLOS and Performance MeasuresDesign (N)Operational (LOS) $\gamma_p < (V \text{ or DDHV}) / (PHF x N x f_{HV} x f_p) 2279 pc/h/ln$	olume, V ADT	6400	veh/h veh/day	Peak-Hour Facto %Trucks and Bu	or, PHF Ises, P <sub>T</sub>	0.95 3	
Calculate Flow Adjustments $f_p$ 1.00 $E_R$ 1.2 $E_T$ 1.5 $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$ 0.985Speed InputsCalc Speed Adj and FFSLane WidthftftRt-Side Lat. Clearanceft $f_{LW}$ Number of Lanes, N3fLcTotal Ramp Density, TRDramps/miTRD AdjustmentFFS (measured)70.0mphBase free-flow Speed, BFFSmphLOS and Performance MeasuresDesign (N)Operational (LOS) $v_p = \langle V \text{ or DDHV} \rangle / (PHF x N x f_{HV} x f_p) 2279 pc/h/lnS56.5 mphD = v_p / S40.3 pc/mi/lnLOSEGlossaryFactor LocationN - Number of lanesS - SpeedV - Hourly volumeD - Densityv_p - Flow rateFFS - Free-flow speedLOS - Level of serviceBFFS - Base free-flow speedDDHV - Directional design hour volumeD-Toensityp_p - Flow rateFFS - Free-flow speedLOS - Level of serviceBFFS - Base free-flow speedDDHV - Directional design hour volumeD-S, S, FFS, v_p - Exhibits 11-2, 11-3$	eak-Hr Direction Prop, D DHV = AADT x K x D		veh/h	General Terrain: Grade % Up	Length /Down %	u Level mi	
	alculate Flow Adjustme	nts					
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $		1.00		E <sub>R</sub>		1.2	
Speed InputsCalc Speed Adj and FFSLane WidthftRt-Side Lat. ClearanceftNumber of Lanes, N3Total Ramp Density, TRDramps/miFFS (measured)70.0Base free-flow Speed, BFFSmphLOS and Performance MeasuresDesign (N)Operational (LOS)yp = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f_p) 2279pc (V or DDHV) / (PHF x N x f <sub>HV</sub> x f_p) 2279pc/h/lnS56.5Design LOSVp = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f_p) 2279Design LOSVp = (V or DDHV) / (PHF x N x f <sub>HV</sub> x f_p) 2279SD = vp / SAd0.3pc/mi/lnSSD = vp / SAd0.3P = vp / SClossaryN - Number of lanesN - Number of lanesS - SpeedV - Hourly volumeD - DensityVp - Flow rateFFS - Free-flow speedLOS - Level of serviceDFFS - Base free-flow speedDDHV - Directional design hour volume	Т	1.5		$f_{HV} = 1/[1+P_T(E_T - 1)]$	1) + P <sub>R</sub> (E <sub>R</sub> - 1)]	0.985	
Lane WidthftRt-Side Lat. ClearanceftNumber of Lanes, N3Total Ramp Density, TRDramps/miFFS (measured)70.0Base free-flow Speed, BFFSmphLOS and Performance MeasuresDesign (N)Operational (LOS) $v_p = (V \text{ or DDHV}) / (PHF x N x f_{HV} x f_p) 2279$ $p_c/h/ln$ S56.5D = $v_p / S$ A 0.3pc/mi/lnLOSEClossaryN - Number of lanesS - SpeedV - Hourly volumeD - Density $v_p$ - Flow rateFFS - Free-flow speedLOS - Level of serviceBFFS - Base free-flow speedDHV - Directional design hour volumeDHV - Directional design hour volume	peed Inputs			Calc Speed A	Adj and FFS	6	
Rt-Side Lat. Clearanceft $f_{LW}$ Number of Lanes, N3 $f_{LC}$ Total Ramp Density, TRDramps/miFFS (measured)70.0mphBase free-flow Speed, BFFSmphDesign (N)Design LOS $v_p = (V \text{ or DDHV}) / (PHF x N x f_{HV} x f_p) 2279S56.5D = v_p / S40.3pc/h/lnS56.5D = v_p / SColspan="2">Colspan="2">Tation Densityv_p / SColspan="2">Colspan="2">ER - Ereiflow speedLOSEDensityv_p - Flow rateFFS - Free-flow speedLOS - Level of serviceBFFS - Base free-flow speedLOS - Level of serviceBFFS - Base free-flow speedDDHV - Directional design hour volumeTation Tation$	ne Width		ft				
Number of Lanes, N3 $f_{LC}$ Total Ramp Density, TRDramps/miTRD AdjustmentFFS (measured)70.0mphBase free-flow Speed, BFFSmphLOS and Performance MeasuresDesign (N)Operational (LOS) $v_p = (V \text{ or DDHV}) / (PHF x N x f_{HV} x f_p) 2279$ $p = v_p / S$ Design LOS $v_p = (V \text{ or DDHV}) / (PHF x N x f_{HV} x f_p) 2279$ $p = v_p / S$ Design LOS $v_p = (V \text{ or DDHV}) / (PHF x N x f_{HV} x f_p) 2279$ $p = v_p / S$ Design LOS $v_p = (V \text{ or DDHV}) / (PHF x N x f_{HV} x f_p) 2279$ $S$ D = $v_p / S$ COS $E$ Base free-flow Speed $V_p = (V \text{ or DDHV}) / (PHF x N x f_{HV} x f_p) S$ $S$ D = $v_p / S$ Required Number of Lanes, NGlossaryN - Number of lanesS - SpeedV - Hourly volumeD - Density $v_p$ - Flow rateFFS - Free-flow speedLOS - Level of serviceBFFS - Base free-flow speedLOS - Level of serviceBFFS - Base free-flow speedDDHV - Directional design hour volume	-Side Lat. Clearance		ft	f <sub>LW</sub>			mph
Total Ramp Density, TRDramps/miTRD AdjustmentFFS (measured)70.0mphFFSBase free-flow Speed, BFFSmphFFSLOS and Performance MeasuresDesign (N) $Qperational (LOS)$ $p = (V \text{ or DDHV}) / (PHF x N x f_{HV} x f_p) 2279$ pc/h/lnS56.5mphD = $v_p / S$ 40.3pc/mi/lnLOSE $P = v_p / S$ CosE $P = v_p / S$ Required Number of Lanes, N $P = v_p / S$ GlossaryFactor LocationN - Number of lanesS - SpeedV - Hourly volumeD - Density $v_p$ - Flow rateFFS - Free-flow speedLOS - Level of serviceBFFS - Base free-flow speedDHV - Directional design hour volumeOr SpeedDES - DensityThe DensityDr - DensityDensityDr - DensityDensityDr - DensityDensityDr - DensityDensityDr - Density <td>umber of Lanes, N</td> <td>3</td> <td></td> <td>f<sub>LC</sub></td> <td></td> <td></td> <td>mph</td>	umber of Lanes, N	3		f <sub>LC</sub>			mph
FFS (measured)70.0mphFFS70.0Base free-flow Speed, BFFSmphFFS70.0LOS and Performance MeasuresDesign (N) $Operational (LOS)$ $v_p = (V \text{ or DDHV}) / (PHF x N x f_{p}) 2279$ pc/h/ln $v_p = (V \text{ or DDHV}) / (PHF x N x f_{p}) 2279$ pc/h/lnDesign LOS $v_p = (V \text{ or DDHV}) / (PHF x N x f_{p}) 2279$ pc/h/ln $v_p = (V \text{ or DDHV}) / (PHF x N x f_{HV} x f_p)$ S56.5mphDesign LOS $D = v_p / S$ 40.3pc/mi/lnLOSEFactor LocationN - Number of lanesS - SpeedV - Hourly volumeD - Density $v_p$ - Flow rateFFS - Free-flow speedLOS - Level of serviceBFFS - Base free-flow speedDHV - Directional design hour volumeDHV - Directional design hour volume	tal Ramp Density, TRD		ramps/mi	TRD Adjustmen	nt		mph
Base free-flow Speed, BFFSmphLOS and Performance MeasuresDesign (N) $Operational (LOS)$ $v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p) 2279 pc/h/lnSDesign (N)Design LOSv_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)SD = v_p / S56.5 mphD = v_p / SD = v_p / S40.3 pc/mi/lnECos$	S (measured)	70.0	mph	FFS		70.0	mph
LOS and Performance MeasuresDesign (N) $Operational (LOS)$ $v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p) 2279 pc/h/lnSDesign (N)Design LOSv_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)SD = v_p / S40.3 pc/mi/lnEDesign (N)Design LOSv_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)SD = v_p / SRequired Number of Lanes, NGlossaryFactor LocationN - Number of lanesS - SpeedV - Hourly volumeV - Hourly volumeD - DensityFFS - Free-flow speedLOS - Level of serviceDFHV - Directional design hour volumeBFFS - Base free-flow speedLOS N, S, FFS, v_p - Exhibits 11-2, 11-3$	ase free-flow Speed, BFFS		mph				·
Design (N)Operational (LOS) $v_p = (V \text{ or DDHV}) / (PHF x N x f_{HV} x f_p) 2279 pc/h/lnS56.5 mphD = v_p / S40.3 pc/mi/lnLOSEFactor LocationObservedFactor LocationN - Number of lanesS - SpeedV - Hourly volumeD - Densityv_p - Flow rateFFS - Free-flow speedLOSLOS - Level of serviceDFFS - Base free-flow speedLOS, S, FFS, v_p - Exhibits 11-2, 11-3DHV - Directional design hour volume$	OS and Performance Mo	easures		Design (N)			
GlossaryFactor LocationN - Number of lanesS - SpeedV - Hourly volumeD - Density $v_p$ - Flow rateFFS - Free-flow speedLOS - Level of serviceBFFS - Base free-flow speedDDHV - Directional design hour volumeLOS - Level of service	oerational (LOS) = (V or DDHV) / (PHF x N x f <sub>t</sub> = v <sub>p</sub> / S OS	<sub>tv</sub> x f <sub>p</sub> ) 2279 56.5 40.3 E	pc/h/ln mph pc/mi/ln	<u>Design (N)</u> Design LOS v <sub>p</sub> = (V or DDHV S D = v <sub>p</sub> / S Required Numbe	′) / (PHF x N x er of Lanes, N	f <sub>HV</sub> x f <sub>p</sub> )	pc/h/ln mph pc/mi/ln
N - Number of lanesS - Speed $E_R$ - Exhibits 11-10, 11-12 $f_L$ V - Hourly volumeD - Density $E_T$ - Exhibits 11-10, 11-11, 11-13 $f_L$ $v_p$ - Flow rateFFS - Free-flow speed $F_T$ - Exhibits 11-10, 11-11, 11-13 $f_L$ LOS - Level of serviceBFFS - Base free-flow speed $F_p$ - Page 11-18TDDHV - Directional design hour volumeLOS, S, FFS, $v_p$ - Exhibits 11-2, 11-3	lossary			Factor Locat	ion		
	N - Number of lanes S - Speed V - Hourly volume D - Density v <sub>p</sub> - Flow rate FFS - Free-flow speed LOS - Level of service BFFS - Base free-flow speed DDHV - Directional design hour volume			E <sub>R</sub> - Exhibits 11- E <sub>T</sub> - Exhibits 11- f <sub>p</sub> - Page 11-18 LOS, S, FFS, v <sub>p</sub>	-10, 11-12 -10, 11-11, 11- - Exhibits 11-2	13 2, 11-3	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-11

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RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Info	rmation			Site Infor	mation					
Analyst Agency or Company Date Performed Analysis Time Perio	y AEC	ОМ	Fr Ju Ju	eeway/Dir of Tra Inction Irisdiction	avel	I-95 N Seg 5	IB -On from Ex	¢p		
Project Description	SW 10th Stree	t SIMR	AI	iaiysis i cai		INO-DL	1110 2040			
Inputs										
		Freeway Num	ber of Lanes N	3						
Upstream Adj Ramp	)	Ramp Numbe	r of Lanes, N	1					Downstrea Ramp	am Adj
Yes O	n	Acceleration I	ane Length, L <sub>A</sub>	600					🗹 Yes	🗌 On
l ✓ No □ O	ff	Freeway Volu	me, V <sub>F</sub>	6400					🗌 No	✓ Off
L <sub>up</sub> = ft		Ramp Volume	e, V <sub>R</sub>	770					L <sub>down</sub> =	5545 ft
V <sub>u</sub> = veh/l	h	Freeway Free Ramp Free-F	low Speed, S <sub>FF</sub>	70.0 50.0					V <sub>D</sub> =	1590 veh/h
Conversion	to pc/h Un	der Base	Conditions							
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv		f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF	x f <sub>HV</sub> x f <sub>p</sub>
Freeway	6400	0.95	Level	3	0	0	).985	1.00	6	838
Ramp	770	0.92	Level	2	0	C	).990	1.00	8	345
UpStream										
DownStream	1590	0.92	Level	2	0	C	).990	1.00	1	746
<b>F</b> - 4i		Diverge Areas								
Estimation o	t v <sub>12</sub>				Estimat	ion	of V <sub>12</sub>			
	V <sub>12</sub> = V <sub>F</sub>	( P <sub>FM</sub> )					V40 = 1	Vn + (Vr - Vn	)P <sub>ED</sub>	
L <sub>EQ</sub> =	10046.0	)3 (Equatio	n 13-6 or 13-7)		L = 0 =		- 12	Fountion 13-	/ FD 12 or 13-1	3)
P <sub>FM</sub> =	0.631	using Equat	tion (Exhibit 13-6)	)	-EQ P =		· · · ·	using Equation	n (Evhibit 1?	L7)
V <sub>12</sub> =	4318	pc/h			FD V =			oc/b		-1)
V. or V	2520	pc/h (Equati	on 13-14 or 13-		$V_{12}$		ł	pc/li no/h (Equation 1	3 11 or 13 1	7)
$V_3 V_{av34}$ Is $V_3$ or $V_{av34} > 2,7$	17) 00 pc/h? 🗌 Ye	s 🗹 No			Is $V_3$ or $V_{av34} > 2,700 \text{ pc/h}? \square \text{Yes} \square \text{No}$					
Is V <sub>3</sub> or V <sub>av34</sub> > 1.5	* V <sub>12</sub> /2 Ve	s 🗌 No			Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$ Yes No					
If Yes,V <sub>12a</sub> =	4318 18. or	pc/h (Equati 13-19)	on 13-16, 13-		lf Yes,V <sub>12a</sub> =	=	 1;	pc/h (Equatio 3-19)	n 13-16, 13	3-18, or
Capacity Ch	ecks	/			Capacit	y Ch	necks			
	Actual		Capacity	LOS F?		-	Actual	Ca	pacity	LOS F?
					V <sub>F</sub>			Exhibit 13-	8	
V <sub>FO</sub>	7683	Exhibit 13-8		Yes	V <sub>FO</sub> = V <sub>F</sub>	- V <sub>R</sub>		Exhibit 13-	8	
					V <sub>R</sub>			Exhibit 13 10	-	
Flow Enterin	g Merge In	fluence A	rea		Flow En	nterii	ng Dive	rge Influen	ce Area	
	Actual	Max	Desirable	Violation?		_	Actual	Max Des	irable	Violation?
V <sub>R12</sub>	5681	Exhibit 13-8	4600:All	Yes	V <sub>12</sub>			Exhibit 13-8		
Level of Serv	vice Detern	nination (	if not F)		Level of	f Ser	vice De	terminatio	n (if not	F)
D <sub>R</sub> = 5.475 + 0.00734 v <sub>R</sub> + 0.0078 V <sub>12</sub> - 0.00627 L <sub>A</sub>					D <sub>R</sub> =	4.252 + 0	.0086 V <sub>12</sub> - 0	.009 L <sub>D</sub>		
D <sub>R</sub> = 45.6 (pc/mi/ln)					D <sub>R</sub> = (p	oc/mi/	′ln)			
LOS = F (Exhibit 13-2)				LOS = (E	Exhibi	it 13-2)				
Speed Determination					Speed L	Dete	rminatic	on		
M <sub>S</sub> = 1.405 (Ex	ibit 13-11)				D <sub>s</sub> = (Exhibit 13-12)					
S <sub>R</sub> = 30.7 mph	(Exhibit 13-11)				S <sub>R</sub> = m ⊙	ph (Ex	(nibit 13-12)			
S <sub>0</sub> = 64.6 mph	(Exhibit 13-11)				S <sub>0</sub> = m	ph (Ex	(hibit 13-12)			
S = 35.5 mph	(Exhibit 13-13)				S= m	ph (Ex	(hibit 13-13)			

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	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed	AECOM		Highway/Direction of Travel From/To Jurisdiction	I-95 NB Seg 6-B	et Exp On & Off to 10th
Analysis Time Period	PM		Analysis Year	No-Build	1 2040
Project Description SW 10t	h Street SIMR				
Oper.(LOS)	)		Des.(N)	Pla	anning Data
Flow Inputs					
Volume, V AADT	7170	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub>	0.95 3	
Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	%RVs, P <sub>R</sub> General Terrain: Grade % Length Up/Down %	0 Level mi	
Calculate Flow Adjustr	ments				
f <sub>p</sub>	1.00		E <sub>R</sub>	1.2	
Е <sub>т</sub>	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
Speed Inputs			Calc Speed Adj and FFS	3	
Lane Width		ft	÷ , , , , , , , , , , , , , , , , , , ,		mah
Rt-Side Lat. Clearance	3	π	ILW f		mph
Total Ramp Density TRD	5	ramps/mi	'LC TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph		1010	p
LOS and Performance	Measures		Design (N)		
Operational (LOS) $v_p = (V \text{ or DDHV}) / (PHF x N)$ S D = $v_p / S$ LOS	x f <sub>HV</sub> x f <sub>p</sub> ) 2554 48.7 52.4 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 <sub>HV</sub> x f <sub>p</sub> )	pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base free our volume	speed ee-flow speed	E <sub>R</sub> - Exhibits 11-10, 11-12 E <sub>T</sub> - Exhibits 11-10, 11-11, 11- f <sub>p</sub> - Page 11-18 LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2	13 2, 11-3	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-11

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RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Infor	rmation			Site Infor	mation					
Analyst			Fr	eeway/Dir of Tr	avel	I-95 NE	}			
Agency or Company	AEC	MC	Ju	nction		Seg 7-	Off Ramp f	to 10th St		
Date Performed			Ju	risdiction		•				
Analysis Time Perio	d PM		Ar	alysis Year		No-Bui	ld 2040			
Project Description	SW 10th Stree	t SMIR								
Inputs		1							i'	
Upstream Adj F	Ramp	Freeway Num	ber of Lanes, N	3					Downstrea	m Adj
		Ramp Numbe	er of Lanes, N	1					Ramp	
Yes	On	Acceleration I	_ane Length, L₄						Ves	V On
		Deceleration	lane length l	250					165	UII OII
I I NO L	Off	Ereeway Volu		7170					🗌 No	🗌 Off
	ft		inie, v <sub>F</sub>	/ 1/0					L. =	130 ft
Lup _		Ramp volume	e, v <sub>R</sub>	1590					-down	
V = v	/eh/h	Freeway Free	e-Flow Speed, S <sub>FF</sub>	70.0					V <sub>D</sub> =	1320 veh/h
<sup>-</sup> u •		Ramp Free-F	low Speed, S <sub>FR</sub>	45.0					D	
Conversion t	to pc/h Und	der Base	Conditions							
(nc/h)	V	PHF	Terrain	%Truck	%Rv		f	f	v = V/PHF	x fx f
(poin)	(Veh/hr)		Tontain	7011001	/01/1		·HV	·p		HV A p
Freeway	7170	0.95	Level	3	0	0.	985	1.00	76	61
Ramp	1590	0.92	Level	2	0	0.	990	1.00	17-	46
UpStream										
DownStream	1320	0.92	Level	2	0	0.	990	1.00	14	49
	<u> </u>	Merge Areas			<b>F</b> ation of		<u> </u>	Diverge Areas		
Estimation o	τν <sub>12</sub>				Estimat		r v <sub>12</sub>			
	$V_{12} = V_{F}$	( P <sub>FM</sub> )					V <sub>12</sub> =	= V <sub>R</sub> + (V <sub>F</sub> - V	R)P <sub>FD</sub>	
	(Equa	tion 13-6 or	13-7)		L <sub>EO</sub> =		(	Equation 13-	12 or 13-13	)
P_, =	usina	Fouation (	Exhibit 13-6)				0	488 usina Ea	uation (Exhil	oit 13-7)
V =	nc/h				гл V., =		4	633  nc/h		
$v_{12}^{-}$	pc/n	Faulation 40	44 40 47)		$^{\circ}12$		2	000 pc/h 000 pc/h (Eau	untion 12 11	or 10 17)
v <sub>3</sub> 01 v <sub>av34</sub>	pc/n (	Equation 13	-14 Of 13-17)		$v_3$ or $v_{av34}$	> 0 7	ان ۵۵ ممرام	uzo pc/n (Equ	Jalion 13-14	0113-17)
Is $V_3$ or $V_{av34} > 2,70$		s ∐No			$ s_{v_3} \circ v_{av34} > 2,700 \text{ pc/m} \neq \text{es}$ No					
Is $V_3$ or $V_{av34} > 1.5$	*V <sub>12</sub> /2 UYes	s 🗌 No			Is $v_3$ or $v_{av34} > 1.5 \text{ m} v_{12}/2$ Yes V No					
lf Yes,V <sub>12a</sub> =	pc/h ( 13 10)	Equation 13	-16, 13-18, or		If Yes,V <sub>12a</sub> = 4961 pc/h (Equation 13-16, 13-18, or 13 10)					
Canadity Ch	13-19)				Canaait	v Ch		1 13-19)		
	CAS		<b>Nama a 1</b> 4 .							
	Actual		apacity	LUSF?			Actual			LUSF?
					v <sub>F</sub>		7661	Exhibit 13-	8 7200	Yes
V <sub>FO</sub>		Exhibit 13-8			$V_{FO} = V_{F}$	- V <sub>R</sub>	5915	Exhibit 13-	8 7200	No
					V <sub>R</sub>		1746	Exhibit 13-	10 2100	No
Flow Enterin	a Merae In	fluence A	rea		Flow En	terin	a Dive	rae Influer	ice Area	
	Actual	Max	Desirable	Violation?			Actual	Max Desira	ble	Violation?
V <sub>P12</sub>		Exhibit 13-8			V <sub>12</sub>	4	1633	Exhibit 13-8	4400:All	Yes
Level of Serv	ice Detern	nination (	if not F)		Level of Service Determination (if not E)					
$D = 5.475 \pm 0.00734 \text{ y} \pm 0.0078 \text{ y} = 0.00237 \text{ y}$										
$D_{\rm R} = (n_0/m_1/m_1)$				$D_{R} = 4.252 \pm 0.0080 \text{ V}_{12} = 0.009 \text{ L}_{D}$						
					μ <sub>R</sub> = 44.7 (pc/mi/ln)					
LOS = (Exhibit 13-2)					LOS = F (Exhibit 13-2)					
Speed Determination				Speed D	Deter	minatio	on			
M <sub>e</sub> = (Exibit 13-11)					D <sub>s</sub> = 0.455 (Exhibit 13-12)					
$S_{p} = mnh (Fvl)$	, hibit 13-11)				S <sub>R</sub> = 57	7.3 mph	(Exhibit	13-12)		
S = mnh(Ext	hibit 12 11)				$v_{R}^{-}$ 37.3 IIIpii (EXIIIDIL 13-12) S.= 70.2 mph (Exhibit 13-12)					
S = mnh (Ext	hihit 12_12)				S - 64	pi		13 12)		
					<u> 0 - 0</u>	ı.∠ mpn		10-10)	0	00/00/10
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	BASIC F	REEWAY SE	GMENTS WORKSHEET			
General Information			Site Information			
Analyst Agency or Company Date Performed	AECOM		Highway/Direction of Travel From/To Jurisdiction	el I-95 NB Seg 8-Bet Off & On 10th S		
Analysis Time Period	PM		Analysis Year	No-Build	2040	
Project Description SW 10th	h Street SIMR				naina Data	
✓ Oper.(LOS)			Des.(N)		inning Data	
	5500			0.05		
Volume, V AADT	5580	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub>	0.95 3		
Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	%RVs, P <sub>R</sub> General Terrain: Grade % Length Up/Down %	0 Level mi		
Calculate Flow Adjustr	nents					
f <sub>p</sub>	1.00		E <sub>R</sub>	1.2		
É <sub>T</sub>	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	3	ft ft	f <sub>LW</sub> f <sub>LC</sub>		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 <sub>p</sub> = (V or DDHV) / (PHF x N ) S D = v <sub>p</sub> / S LOS	x f <sub>HV</sub> x f <sub>p</sub> ) 1987 62.8 31.6 D	pc/h/ln mph pc/mi/ln	<u>Design (N)</u> Design LOS $v_p = (V \text{ or DDHV}) / (PHF x N x)$ S D = $v_p / S$ Required Number of Lanes, N	f <sub>HV</sub> x f <sub>p</sub> )	pc/h/ln mph pc/mi/ln	
Glossary			Factor Location			
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base free our volume	speed ee-flow speed	E <sub>R</sub> - Exhibits 11-10, 11-12 E <sub>T</sub> - Exhibits 11-10, 11-11, 11- f <sub>p</sub> - Page 11-18 LOS, S, FFS, v <sub>p</sub> - Exhibits 11-	-13 2, 11-3	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-11	

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		RA	MPS AND	RAMP JUN	CTIONS W	ORKSH	EET				
Genera	I Infor	mation			Site Infor	mation					
Analyst				Fi	reeway/Dir of Tra	avel	I-95 N	IB			
Agency or (	Company	AEC	ОМ	Ju	unction		Seg 9	-On Ramp 1	0th St EB & WE	}	
Date Perfor	rmed			Ju	urisdiction		•				
Analysis Tir	me Period	PM		A	nalysis Year		No-Bu	uild 2040			
Project Des	scription	SW 10th Stree	t SIMR								
Inputs											
	\di Domo		Freeway Num	ber of Lanes, N	3					Downstroa	m Adi
Opsilean P	auj namp		Ramp Numbe	r of Lanes. N	1					Ramp	in Auj
✓ Yes	🗌 On		Accoloration I	ano Longth L	1245						
Desclaration Lang Langth L										∐ Yes	On
■ No I Off Deceleration Lane Length L <sub>D</sub>										✓ No	Off
		Freeway Volu	me, V <sub>F</sub>	5580							
L <sub>up</sub> =	1370	ft	Ramp Volume	e, V <sub>R</sub>	1320					L <sub>down</sub> =	ft
			Freeway Free	-Flow Speed, S	70.0					V	
$V_u = 1590 \text{ veh/h}$ Ramp Free-Flow Speed, S <sub>rp</sub> 50.0								v <sub>D</sub> =	ven/n		
Conver	rsion to	o pc/h Un	der Base	Conditions							
(nc/	/h)	V		Torrain	%Truck	% Pv		f	f		x fx f
(pc/	11)	(Veh/hr)		Terrain	70 TTUCK	/01.00		'HV	'p	v — v/i i ii	∧ ' <sub>HV</sub> ∧ 'p
Freeway		5580	0.95	Level	3	0	0	).985	1.00	59	962
Ramp		1320	0.92	Level	2	0	0	).990	1.00	14	149
UpStream		1590	0.92	Level	2	0	0	).990	1.00	17	746
DownStream											
		-	Merge Areas				-		viverge Areas		
Estimat	tion of	v <sub>12</sub>				Estimation of v <sub>12</sub>					
		V <sub>12</sub> = V <sub>F</sub>	( P <sub>FM</sub> )					V - V		\D	
L <sub>E0</sub> =		2396.13	(Equation	13-6 or 13-7)		_		v 12 <sup>−</sup>		/ FD	
P =		0 550	using Equat	tion (Exhibit 13-6	)	Eq =		(	Equation 13-	12 or 13-13	3)
· FM		2001	no/h		)	P <sub>FD</sub> =		ι	using Equatio	n (Exhibit 13	-7)
v 12 -		3201	μc/π 			V <sub>12</sub> =		F	oc/h		
$V_3$ or $V_{av34}$		2001	pc/n (Equati	on 13-14 or 13-	-	$V_3$ or $V_{av34}$			oc/h (Equation 1	3-14 or 13-17	')
ls V. or V	> 2 70	$0 \text{ nc/h} 2 \square V_{o}$				Is V <sub>3</sub> or V <sub>31</sub>	<sub>34</sub> > 2,	700 pc/h? [	Yes No		
le V or V	v34 · 2,10					Is V <sub>2</sub> or V	>1.	5 * V <sub>40</sub> /2			
15 v <sub>3</sub> 01 v <sub>a</sub>	<sub>v34</sub> ~ 1.5	v <sub>12</sub> /∠ ⊻ Ye	S [] NO	10 10 10		av	34	- 12'- L	c/h (Fouatio	n 13-16, 13	-18. or
If Yes,V <sub>12a</sub>	=	3406 18 or	pc/n (Equati 13 10)	on 13-16, 13-		If Yes,V <sub>12a</sub> =	=	13	3-19)	,	,
Canacia	ty Cho	rks	10-19)			Canacit	v Ch	ocks			
Capach	ly one	Actual		`anaoity			y ch	Actual	Co	agaity	
<u> </u>		Actual	<u> </u>	apacity	LUSF?	V		Actual			LUGF?
						v <sub>F</sub>			Exhibit 13-	0	
V <sub>F</sub>	0	7411	Exhibit 13-8		Yes	V <sub>FO</sub> = V <sub>F</sub>	- V <sub>R</sub>		Exhibit 13-	8	
	-					Vp			Exhibit 13	-	
	nto vino		fluonoo						10		
FIOW EI	ntering	Actual	Max	Nesirable	Violation?	FIOW ET		Actual	<b>ge influer</b> Max Desi	irable	Violation?
V		/855	Evhibit 13-8	1600·All	Ves	V	+	/ lotau	Evhibit 13_8		Violation.
	12 f Sorta	ico Dotorr	ningtion (	if not E)	163		<u> </u>		torminatio	n /if not	<b>E</b> )
Levero						Levero	Ser	vice De			<u></u>
	- 5.4/5 +	0.00734V <sub>R</sub> +(		$UU021 L_A$			υ <sub>R</sub> =	4.252 + 0	υυσο ν <sub>12</sub> - 0	.009 L <sub>D</sub>	
D <sub>R</sub> = 3	34.2 (pc/m	i/ln)				D <sub>R</sub> = (r	)c/mi/	ʻln)			
LOS = F	Exhibit 2	13-2)				LOS = (E	Exhibi	it 13-2)			
Speed I	Speed Determination Speed Determination										
M <sub>S</sub> = 0	).687 (Exit	pit 13-11)				D <sub>s</sub> = (E	Exhibit	13-12)			
S <sub>□</sub> = 5	50.8 mph (	Exhibit 13-11)				S <sub>R</sub> = m	iph (Ex	(hibit 13-12)			
S_= 6	19 mnh (	Exhibit 13_11)				S₀= m	iph (Ex	(hibit 13-12)			
S = 5	54.1 mnh (	Exhibit 13-11)				S = m		hihit 13_13)			
<u>۲ </u>	, 1 mhn (					۳- ۳		(10-13)			

	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed	AECOM		Highway/Direction of Travel From/To Jurisdiction	I-95 NB Seg 10-I	Bet 10th St & Hillsboro
Analysis Time Period	PM		Analysis Year	No-Buila	1 2040
Project Description SW 10t	th Street SIMR				
✓ Oper.(LOS)	)		Des.(N)	Pla	inning Data
Flow Inputs					
Volume, V AADT	6900	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub>	0.95 3	
Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	%RVs, P <sub>R</sub> General Terrain: Grade % Length Up/Down %	0 Level mi	
Calculate Flow Adjusti	ments				
f <sub>p</sub>	1.00		E <sub>R</sub>	1.2	
É <sub>T</sub>	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 #	f		mph
Number of Lanes, N	3	π	f <sub>LC</sub>		mph
Total Ramp Density, TRD FFS (measured) Base free-flow Speed, BFFS	70.0	ramps/mi mph mph	TRD Adjustment	70.0	mph mph
LOS and Performance	Measures		Design (N)		
<u>Operational (LOS)</u> v <sub>p</sub> = (V or DDHV) / (PHF x N S D = v <sub>p</sub> / S LOS	x f <sub>HV</sub> x f <sub>p</sub> ) 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 <sub>HV</sub> x f <sub>p</sub> )	pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base fre	speed ee-flow speed	E <sub>R</sub> - Exhibits 11-10, 11-12 E <sub>T</sub> - Exhibits 11-10, 11-11, 11- f <sub>p</sub> - Page 11-18 LOS, S, FFS, v <sub>p</sub> - Exhibits 11-	-13 2, 11-3	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-11

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	RAMPS AND RAMP JUNCTIONS WORKSHEET											
General Info	rmation			Site Infor	mation							
Analyst			Fre	eeway/Dir of Tr	avel	I-95 NE	}					
Agency or Company	y AECO	MC	Ju	nction	;	Seg 11	-Off Ramp	Hillsboro EB				
Date Performed			Ju	risdiction		•						
Analysis Time Peric	od PM		An	alysis Year		No-Bui	ld 2040					
Project Description	SW 10th Stree	t SIMR										
Inputs		¥							1			
Upstream Adi I	Ramp	Freeway Nun	nber of Lanes, N	3					Downstrea	m Adi		
		Ramp Numbe	er of Lanes, N	1					Ramp	-,		
I Yes □	✓ On	Acceleration	Lane Length, L									
		Deceleration	lane Length L	220								
	Off	Erooway Volu		6000					🗹 No	🗌 Off		
	0.95 #		ine, v <sub>F</sub>	0900					1. =	ft		
L <sup>up</sup> - 3	005 11	Ramp volum	e, v <sub>R</sub>	750					-down			
V = 1	V <sub>.</sub> , = 1320 veh/h								V <sub>D</sub> =	veh/h		
Ramp Free-Flow Speed, S <sub>FR</sub> 45									D			
Conversion	to pc/h Und	der Base	Conditions									
(nc/h)	%Truck	%Rv		f	f	v = V/PHF	x fx f					
(poin)	(pc/n) (Veh/hr) PHF Terrain %Truck						·HV	p		HV A p		
Freeway	6900	0.95	Level	3	0	0.	985	1.00	73	72		
Ramp	750	0.92	Level	2	0	0.	990	1.00	82	.3		
UpStream	1320	0.92	Level	2	0	0.	990	1.00	144	19		
DownStream	<u> </u>											
<b>F</b> atimation o	<b>.</b>	Merge Areas			Diverge Areas							
Estimation o	<sup>or v</sup> 12				Estimati	on o	<sup>r v</sup> 12					
	$V_{12} = V_{F}$	( P <sub>FM</sub> )					V <sub>12</sub> =	= V <sub>R</sub> + (V <sub>F</sub> - V	′ <sub>R</sub> )P <sub>FD</sub>			
L <sub>E0</sub> =	(Equa	ition 13-6 or	13-7)		L <sub>EO</sub> =		8	140.08 (Equat	ion 13-12 oi	r 13-13)		
P =	usina	Equation (	Fxhibit 13-6)				0.	538 usina Fa	uation (Exhib	oit 13-7)		
	nc/h				го V., =		4	$\frac{345}{245}$ nc/h				
$v_{12}^{-}$	pc/11	Faulation 10	44 40 47)		$^{12}$			043 pc/n	untion 12 11	or 10 17)		
v <sub>3</sub> 01 v <sub>av34</sub>	pc/n (	Equation 13	5-14 Of 13-17)		$v_3$ $v_{av34}$	> 0 7	ე( იი ოი/სე ⊏		Jalion 13-14	0[13-17]		
Is $v_3$ or $v_{av34} > 2,7$		s ∐No			IS V <sub>3</sub> OI V <sub>av3</sub>	<sub>4</sub> ~ 2,1						
Is $V_3$ or $V_{av34} > 1.5$	* V <sub>12</sub> /2 Yes	s 🗌 No			Is V <sub>3</sub> or V <sub>av3</sub>	<sub>4</sub> > 1.5	^ V <sub>12</sub> /2	_Yes ⊻No				
lf Yes,V <sub>12a</sub> =	pc/h (	Equation 13	3-16, 13-18, or		If Yes,V <sub>12a</sub> =		46	672 pc/h (Εqι	uation 13-16	, 13-18,		
Capacity Ch	13-19)				Canaaita	(Ch		113-19)				
	Astual		Non a site				Astro					
	Actual			LUSF?			Actual			LUSF?		
					V <sub>F</sub>		/3/2	Exhibit 13-	8 7200	Yes		
V <sub>FO</sub>		Exhibit 13-8			$V_{FO} = V_{F}$	- V <sub>R</sub>	6549	Exhibit 13-	8 7200	No		
					V <sub>R</sub>		823	Exhibit 13-	10 2100	No		
Flow Enterin	a Merae In	fluence A	Area		Flow En	terin	a Dive	rae Influer	ice Area			
	Actual	Max	Desirable	Violation?	_		Actual	Max Desira	ble	Violation?		
V <sub>P12</sub>		Exhibit 13-8			V <sub>12</sub>	4	1345	Exhibit 13-8	4400:All	No		
Level of Ser	ice Detern	nination (	(if not F)		l evel of	Ser	vice De	terminatio	n (if not l	=)		
$D = 5.475 \pm 0$	00734 v + 0	0.0078.\/	0.006271			$rac{1}{2} = 4$	252 + 0			/		
$D_{\rm R} = 0.473 \pm 0$		0.0070 v <sub>12</sub>	- 0.00027 L <sub>A</sub>			7 <sub>R</sub> – 4	, .,, .	.0000 v <sub>12</sub> - 0	.009 L <sub>D</sub>			
υ <sub>R</sub> = (pc/mi/ln)						.5 (pc	/mi/in)					
LOS = (Exhibit	OS = (Exhibit 13-2)						oit 13-2)					
Speed Deter	peed Determination						minatio	on				
M <sub>s</sub> = (Exibit 1	= (Exibit 13-11)						$D_s = 0.372$ (Exhibit 13-12)					
$S_{n} = mnh (Ev)$	, hihit 13_11)				$S_{\rm D}$ = 59.6 mph (Exhibit 13-12)							
	hibit 12 11)				$S_0 = 70.2 \text{ mph} (Exhibit 13-12)$							
S = mph(Ex)	hibit 13-11)				S - 60	1 mm	(Evhibit	13 12)				
					<u>- 03</u>	. i inpi		10-10)	0			
yright © 2016 Univers	ity of Florida, All R	lights Reserved			HCS2010™	Versio	n 6.90		Generated: 5/2	22/2019 11:45		

	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed	AECOM		Highway/Direction of Travel From/To Jurisdiction	l-95 NB Seg 12-l	Bet Off & On Hillsboro
Analysis Time Period	PM		Analysis Year	No-Buila	1 2040
Project Description SW 10th	h Street SIMR				
Oper.(LOS)			Des.(N)	🗌 Pla	inning Data
Flow Inputs					
Volume, V AADT	6150	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub>	0.95 3	
Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	%RVs, P <sub>R</sub> General Terrain: Grade % Length Up/Down %	0 Level mi	
Calculate Flow Adjustr	nents				
f <sub>p</sub>	1.00		E <sub>R</sub>	1.2	
E <sub>T</sub>	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
Speed Inputs			Calc Speed Adj and FFS	3	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f <sub>LW</sub>		mph
Number of Lanes, N	3		T <sub>LC</sub>		mpn
EES (moasured)	70.0	ramps/mi		70.0	mpn
Rase free flow Speed REES	70.0	mph	FFS	70.0	mpn
		трп			
LOS and Performance	Measures		Design (N)		
<u>Operational (LOS)</u> v <sub>p</sub> = (V or DDHV) / (PHF x N : S D = v <sub>p</sub> / S LOS	x f <sub>HV</sub> x f <sub>p</sub> )2190 58.6 37.4 E	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 <sub>HV</sub> x f <sub>p</sub> )	pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base freeur volume	speed ee-flow speed	E <sub>R</sub> - Exhibits 11-10, 11-12 E <sub>T</sub> - Exhibits 11-10, 11-11, 11- f <sub>p</sub> - Page 11-18 LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2	13 2, 11-3	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-11

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			FREEWA	Y WEAV	ING WOF	RKSHEE	Т				
Genera	I Informati	on			Site Information						
Analyst Agency/Cc Date Perfo Analysis Ti	mpany rmed me Period	AECO PM	М		Freeway/Dir of Travel I-95 NB Weaving Segment Location Seg 13-Bet On & Off Hillsboro Analysis Year No-Build 2040						
Project De	scription SW 10t	h Street SIM	२								
Inputs					r						
Weaving c Weaving n Weaving s Freeway fr	onfiguration umber of lanes, I egment length, L ee-flow speed, F	N s FS		One-Sided 4 790ft 70 mph	Segment typ Freeway min Freeway ma: Terrain type	e imum speed ximum capac	, S <sub>MIN</sub> city, C <sub>IFL</sub>		Freewa 1: 240 Leve		
Convei	sions to p	c/h Unde	r Base Co	ondition	s	0	•	Ĩ.	1		
	V (veh/h)	PHF	Truck (%)	RV (%)	Ε <sub>Τ</sub>	E <sub>R</sub>	f <sub>HV</sub>	fp	v (pc/h)		
V <sub>FF</sub>	5460	0.95	3	0	1.5	1.2	0.985	1.00	5834		
V <sub>RF</sub>	730	0.92	2	0	1.5	1.2	0.990	1.00	801		
V <sub>FR</sub>	690	0.92	2	0	1.5	1.2	0.990	1.00	758		
V <sub>RR</sub>	0	0.95	2	0	1.5	1.2	0.990	1.00	0		
V <sub>NW</sub>	5834		•	-	-		-	V =	7393		
V <sub>w</sub>	1559							-	-		
VR	0.211										
Config	uration Cha	aracteris	tics		-						
Minimum r	naneuver lanes,	N <sub>WL</sub>		2 lc	Minimum we	eaving lane c	hanges, LC <sub>MIN</sub>		1559 lc/h		
Interchang	e density, ID			0.7 int/mi	Weaving lan	e changes, L	-C <sub>w</sub>		1770 lc/h		
Minimum F	RF lane changes	, LC <sub>RF</sub>		1 lc/pc	Non-weaving	g lane chang	es, LC <sub>NW</sub>		860 lc/h		
Minimum F	R lane changes	, LC <sub>FR</sub>		1 lc/pc	Total lane ch	nanges, LC <sub>AL</sub>	L		2630 lc/ł		
Minimum F	RR lane changes	, LC <sub>RR</sub>		lc/pc	Non-weaving	g vehicle inde	ex, I <sub>NW</sub>		323		
Weavir	ng Segmen	t Speed,	Density,	Level of	Service,	and Cap	pacity				
Weaving s	egment flow rate	, V		7291 veh/h	Weaving inte	ensity factor,	W		0.584		
Weaving s	egment capacity	, c <sub>w</sub>		8296 veh/h	Weaving see	gment speed	, S		49.9 mph		
Weaving s	egment v/c ratio			0.879	Average wea	aving speed,	S <sub>w</sub>		49.7 mph		
Weaving segment density, D 37.1 pc/mi/ln					In Average non-weaving speed, S <sub>NW</sub>				49.9 mpł		
Level of Se	ervice, LOS			E	Maximum weaving length, L <sub>MAX</sub> 4648 ft						
Notes											
a. Weaving	segments longer t	han the calculation of the calcu	ated maximum le	ength should l	be treated as is	solated merge	and diverge ar	eas using the	procedures of		

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

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	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed	AECOM		Highway/Direction of Travel From/To Jurisdiction	l-95 NB Seg 14-l	Bet Off & On Hillsboro
Analysis Time Period	PM		Analysis Year	No-Build	1 2040
Project Description SW 10t	h Street SIMR				
Oper.(LOS)			Des.(N)	Pla	anning Data
Flow Inputs					
Volume, V AADT	6190	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub>	0.95 3	
Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	%RVs, P <sub>R</sub> General Terrain: Grade % Length Up/Down %	0 Level mi	
Calculate Flow Adjustr	nents				
f <sub>p</sub>	1.00		E <sub>R</sub>	1.2	
É <sub>T</sub>	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
Speed Inputs			Calc Speed Adj and FFS	3	
Lane Width		ft			
Rt-Side Lat. Clearance	_	ft	f <sub>LW</sub>		mph
Number of Lanes, N	3	, .			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> $v_p = (V \text{ or DDHV}) / (PHF x N)$ S D = $v_p / S$ LOS	x f <sub>HV</sub> x f <sub>p</sub> ) 2205 58.3 37.8 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 <sub>HV</sub> x f <sub>p</sub> )	pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base free our volume	speed ee-flow speed	E <sub>R</sub> - Exhibits 11-10, 11-12 E <sub>T</sub> - Exhibits 11-10, 11-11, 11- f <sub>p</sub> - Page 11-18 LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2	13 2, 11-3	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-11

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		F	REEWA	Y WEAV	ING WOR	RKSHEE	Г			
Genera	I Informati	on			Site Information					
Analyst Agency/Co Date Perfor Analysis Tir	mpany rmed me Period	AECON PM	И		Freeway/Dir of Travel I-95 NB Weaving Segment Location Seg 15-Bet On & Off to Exp Analysis Year No-Build 2040					
Project Des	scription SW 10t	h Street SIMF	R							
Inputs					1					
Weaving configurationTwo-SidedWeaving number of lanes, N3Weaving segment length, Ls4665ftFreeway free-flow speed, FFS70 mph					Segment type Freew Freeway minimum speed, S <sub>MIN</sub> Freeway maximum capacity, C <sub>IFL</sub> 24 Terrain type Le					
Conver	sions to po	c/h Unde	r Base Co	ondition	S		1	r	<b>.</b>	
	V (veh/h)	PHF	Truck (%)	RV (%)	Ε <sub>Τ</sub>	E <sub>R</sub>	f <sub>HV</sub>	fp	v (pc/h)	
V <sub>FF</sub>	5040	0.95	3	0	1.5	1.2	0.985	1.00	5385	
V <sub>RF</sub>	610	0.92	2	0	1.5	1.2	0.990	1.00	670	
V <sub>FR</sub>	1150	0.92	2	0	1.5	1.2	0.990	1.00	1263	
V <sub>RR</sub>	130	0.92	2	0	1.5	1.2	0.990	1.00	143	
V <sub>NW</sub>	7318			-	-			V =	7461	
V <sub>W</sub>	143							-	-	
VR	0.019									
Config	uration Cha	aracterist	tics							
Minimum n	naneuver lanes,	N <sub>WI</sub>		0 lc	Minimum we	aving lane cl	nanges, LC <sub>MIN</sub>		lc/h	
Interchang	e density, ID			0.7 int/mi	Weaving lan	e changes, L	C <sub>w</sub>		lc/h	
Minimum F	RF lane changes,	$\mathrm{LC}_{\mathrm{RF}}$		0 lc/pc	Non-weaving	g lane chang	es, LC <sub>NW</sub>		lc/h	
Minimum F	R lane changes,	$LC_{FR}$		0 lc/pc	Total lane ch	nanges, LC <sub>ALI</sub>			lc/h	
Minimum F	R lane changes	, LC <sub>RR</sub>		3 lc/pc	Non-weaving	g vehicle inde	ex, I <sub>NW</sub>			
Weavin	g Segmen	t Speed,	Density,	Level of	Service,	and Cap	acity			
Weaving s	egment flow rate	, V		7360 veh/h	Weaving inte	ensity factor,	W			
Weaving s	egment capacity	, C <sub>w</sub>		6813 veh/h	Weaving seg	gment speed	S		mph	
Weaving s	egment v/c ratio			1.080	Average wea	aving speed,	Sw		mph	
Weaving s	egment density,	D		pc/mi/ln	/In Average non-weaving speed, S <sub>NW</sub>				mph	
Level of Se	ervice, LOS			F	Maximum weaving length, L <sub>MAX</sub> 5905 ft					
Notes										
a. Weaving	segments longer t	han the calcula	ted maximum le	ength should I	be treated as is	olated merge	and diverge ar	eas using the	procedures of	

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

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	BASIC F	REEWAY SE	GMENTS WORKSHEET		
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- FDOT D No-Build	North of Hillsboro 14 1 2040
Project Description SW 10th	h Street SIMR				
✓ Oper.(LOS)	)		Des.(N)	Pla	anning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D	5650	veh/h veh/day veh/h	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub> %RVs, P <sub>R</sub> General Terrain: Grade % Length	0.95 3 0 Level mi	
Calculato Elow Adjustr	nonte		Up/Down %		
	1.00 1.5		E <sub>R</sub> f <sub>LN</sub> = 1/[1+P <sub>T</sub> (E <sub>T</sub> - 1) + P <sub>B</sub> (E <sub>B</sub> - 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 <sub>LW</sub> f <sub>LC</sub> TRD Adjustment FFS	70.0	mph mph mph mph
LOS and Performance	Measures		Design (N)		
<u>Operational (LOS)</u> v <sub>p</sub> = (V or DDHV) / (PHF x N ) S D = v <sub>p</sub> / S LOS	x f <sub>HV</sub> x f <sub>p</sub> )2012 62.4 32.3 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 <sub>HV</sub> x f <sub>p</sub> )	pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base free our volume	speed ee-flow speed	E <sub>R</sub> - Exhibits 11-10, 11-12 E <sub>T</sub> - Exhibits 11-10, 11-11, 11- f <sub>p</sub> - Page 11-18 LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2	13 2, 11-3	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - 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	AECOM		Highway/Direction of Travel From/To Jurisdiction	I-95 SB Seg 1-B	et Hillsboro & Palmetto
Analysis Time Period	AM		Analysis Year	NO-Build	1 2040
			Des (NI)	Pla	anning Data
Flow Inputs	/		Des.(IV)		
Volume, V AADT	4870	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub>	0.95 3	
Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	%RVs, P <sub>R</sub> General Terrain: Grade % Length Up/Down %	0 Level mi	
Calculate Flow Adjustr	ments				
f <sub>p</sub>	1.00		E <sub>R</sub>	1.2	
E <sub>T</sub>	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
Speed Inputs			Calc Speed Adj and FFS	3	
Lane Width Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured)	3 70.0	ft ft ramps/mi mph	f <sub>LW</sub> f <sub>LC</sub> TRD Adjustment FFS	70.0	mph mph mph mph
	M	трп			
Derational (LOS) $v_p = (V \text{ or DDHV}) / (PHF x N)$ S $D = v_p / S$ LOS	x f <sub>HV</sub> x f <sub>p</sub> ) 1734 66.7 26.0 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 <sub>HV</sub> x f <sub>p</sub> )	pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base fre our volume	speed ee-flow speed	E <sub>R</sub> - Exhibits 11-10, 11-12 E <sub>T</sub> - Exhibits 11-10, 11-11, 11- f <sub>p</sub> - Page 11-18 LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2	13 2, 11-3	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-11

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		F	REEWA	Y WEAV	NG WOR	RKSHEE	Т				
Genera	I Informati	on			Site Information						
Analyst Agency/Co Date Perfo Analysis Ti	mpany rmed me Period	AECON AM	И		Freeway/Dir of Travel I95/SB Weaving Segment Location Seg 2-Bet On from Exp & Off Analysis Year No-Build 2040						
Project De	scription SW 10t	h Street SIMF	R								
Inputs											
Weaving configurationTwo-SidedWeaving number of lanes, N3Weaving segment length, Ls5085ftFreeway free-flow speed, FFS70 mph					Segment type     Freew       Freeway minimum speed, S <sub>MIN</sub> Freeway maximum capacity, C <sub>IFL</sub> 24     Terrain type						
Conver	sions to po	c/h Unde	r Base Co	ondition	5		1	1	<del></del>		
	V (veh/h)	PHF	Truck (%)	RV (%)	Ε <sub>Τ</sub>	E <sub>R</sub>	f <sub>HV</sub>	fp	v (pc/h)		
V <sub>FF</sub>	3585	0.95	3	0	1.5	1.2	0.985	1.00	3830		
V <sub>RF</sub>	1265	0.92	2	0	1.5	1.2	0.990	1.00	1389		
V <sub>FR</sub>	1285	0.92	2	0	1.5	1.2	0.990	1.00	1411		
V <sub>RR</sub>	145	0.92	2	0	1.5	1.2	0.990	1.00	159		
V <sub>NW</sub>	6630			-			-	V =	6789		
V <sub>w</sub>	159							-			
VR	0.023										
Config	uration Cha	aracterist	tics								
Minimum r	naneuver lanes,	N <sub>WI</sub>		0 lc	Minimum we	aving lane cl	hanges, LC <sub>MIN</sub>		477 lc/h		
Interchang	e density, ID			0.7 int/mi	Weaving lan	e changes, L	.C <sub>w</sub>		848 lc/h		
Minimum F	RF lane changes,	$\mathrm{LC}_{\mathrm{RF}}$		0 lc/pc	Non-weaving	g lane chang	es, LC <sub>NW</sub>		3167 lc/h		
Minimum F	R lane changes,	$LC_{FR}$		0 lc/pc	Total lane ch	nanges, LC <sub>AL</sub>	L		4015 lc/h		
Minimum F	RR lane changes	, LC <sub>RR</sub>		3 lc/pc	Non-weaving	g vehicle inde	ex, I <sub>NW</sub>		2360		
Weavin	ig Segmen	t Speed,	Density,	Level of	Service,	and Cap	oacity				
Weaving s	egment flow rate	, V		6704 veh/h	Weaving inte	ensity factor,	W		0.188		
Weaving s	egment capacity	, C <sub>w</sub>		6899 veh/h	Weaving seg	gment speed	, S		55.8 mph		
Weaving s	egment v/c ratio			0.972	Average weaving speed, S <sub>w</sub>				61.3 mph		
Weaving s	egment density,	D	4	0.5 pc/mi/ln	/In Average non-weaving speed, S <sub>NW</sub>				55.7 mph		
Level of Se	ervice, LOS			E	Maximum weaving length, L <sub>MAX</sub> 5944 ft						
Notes											
a. Weaving	segments longer t	han the calcula	ted maximum le	ength should I	be treated as is	olated merge	and diverge ar	eas using the	procedures of		

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

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	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed	AECOM		Highway/Direction of Travel From/To Jurisdiction	l-95 SB Seg 3-Bo	et Off & On Ramp
Analysis Time Period	AM		Analysis Year	No-Build	1 2040
Project Description SW 10th	h Street SIMR				uning Data
✓ Oper.(LOS)			Jes.(N)		inning Data
	4050		Deals Hours Franker, DUF	0.05	
AADT	4850	veh/day	%Trucks and Buses, P <sub>T</sub>	0.95 3	
Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	%RVs, P <sub>R</sub> General Terrain: Grade % Length Up/Down %	0 Level mi	
Calculate Flow Adjustr	nents				
f <sub>p</sub>	1.00		E <sub>R</sub>	1.2	
É <sub>T</sub>	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	3	ft ft	f <sub>LW</sub> f <sub>LC</sub>		mph mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured) Base free-flow Speed, BFFS	70.0	mph mph	FFS	70.0	mph
LOS and Performance	Measures		Design (N)		
<u>Operational (LOS)</u> v <sub>p</sub> = (V or DDHV) / (PHF x N ) S D = v <sub>p</sub> / S LOS	x f <sub>HV</sub> x f <sub>p</sub> ) 1727 66.8 25.9 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 <sub>HV</sub> x f <sub>p</sub> )	pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base free our volume	speed ee-flow speed	E <sub>R</sub> - Exhibits 11-10, 11-12 E <sub>T</sub> - Exhibits 11-10, 11-11, 11- f <sub>p</sub> - Page 11-18 LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2	13 2, 11-3	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-11

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RAMPS AND RAMP JUNCTIONS WORKSHEET												
General Int	formation			Site Infor	mation							
Analyst Agency or Comp Date Performed Analysis Time Pe	any AEC eriod AM	OM	Fr Ju Ju Ar	eeway/Dir of Tra Inction Irisdiction nalysis Year	avel	I-95 S Seg 4 No-Bu	B -Merge from ıild 2040	I Hillsboro WB				
Project Description	on SW 10th Stree	et SIMR		•								
Inputs												
Upstream Adj Ra	imp	Freeway Num Ramp Numbe	ber of Lanes, N r of Lanes, N	3 1					Downstrea Ramp	ım Adj		
🗹 Yes 🗌	On	Acceleration L	ane Length, L <sub>A</sub>	950					□ Yes	🗌 On		
🗌 No 🗹	Off	Freeway Volu	Lane Lengtn L <sub>D</sub> me, V <sub>F</sub>	4850					🗹 No	Off		
L <sub>up</sub> = 2175 ft Ramp Volume, V <sub>R</sub> 750							L <sub>down</sub> =	ft				
$V_{u} = 143$	0 veh/h	Ramp Free-Fl	ow Speed, S <sub>FR</sub>	50.0					V <sub>D</sub> =	veh/h		
Conversio	n to pc/h Un	der Base	Conditions	1	<b>1</b>				1			
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv		f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF	x f <sub>HV</sub> x f <sub>p</sub>		
Freeway	4850	0.95	Level	3	0	0	).985	1.00	5	182		
Ramp	750	0.92	Level	2	0	0	).990	1.00	3	23		
UpStream	1430	0.92	Level	2	0	0	).990	1.00	1:	570		
DownStream		Morgo Areas					I	)iverge Areas				
Estimation	Merge Areas Estimation of v <sub>12</sub>						Estimation of v <sub>12</sub>					
	V <sub>12</sub> = V <sub>F</sub>	(P <sub>EM</sub> )					V - V		\D			
L <sub>E0</sub> =	1919.8	7 (Equation	13-6 or 13-7)		_		v <sub>12</sub> –	v <sub>R</sub> + (v <sub>F</sub> - v <sub>R</sub>	۲ <sup>-</sup> FD	2)		
	0.604	using Equat	ion (Exhibit 13-6)	1	EQ -		(	Equation 13-	· 12 Of 13-1	5) \		
V <sub>10</sub> =	3130	nc/h	(,		FD -		ι	using Equatio	n (Exnibit 13	-1)		
12	2052	pc/h (Equati	on 13-14 or 13-		v <sub>12</sub> =		F	oc/h		-		
$V_3$ or $V_{av34}$ Is $V_2$ or $V_{av34} > 2$	17) 2.700 pc/h? 🗔 Ye	s VNo			$V_3$ or $V_{av34}$ Is $V_3$ or $V_{av}$	, <sub>34</sub> > 2, <sup>-</sup>	 700 pc/h?	pc/h (Equation 1 ∃Yes	13-14 or 13-1	()		
Is V <sub>o</sub> or V <sub>o</sub> > $^{3}$	1.5 * V. /2 Ve				Is V <sub>3</sub> or V <sub>av</sub>	<sub>34</sub> > 1.	5 * V <sub>12</sub> /2	Yes No				
If Yes,V <sub>12a</sub> =	3130	pc/h (Equati	on 13-16, 13-		If Yes,V <sub>12a</sub> =	=	13 13	oc/h (Equatio 3-19)	n 13-16, 13	3-18, or		
Capacity C	hecks	10 10/			Capacit	v Ch	necks					
	Actual		Capacity	LOS F?	T		Actual	Car	pacity	LOS F?		
					V <sub>F</sub>			Exhibit 13-	8			
V <sub>FO</sub>	6005	Exhibit 13-8		No	V <sub>FO</sub> = V <sub>F</sub>	- V <sub>R</sub>		Exhibit 13-	8			
					V <sub>R</sub>			Exhibit 13 10	-			
Flow Enter	ing Merge Ir	nfluence A	rea		Flow En	<u>iterii</u>	ng Dive	rge Influen	ice Area	101.0		
	Actual	Max	Desirable	Violation?			Actual	Max Des	irable	Violation?		
V <sub>R12</sub>	3953	Exhibit 13-8	4600:All	No	V <sub>12</sub>			Exhibit 13-8				
Level of Se	ervice Deteri	nination (	if not F)		Level of	f Ser	vice De	terminatio	n (if not	F)		
D <sub>R</sub> = 5.47	′5 + 0.00734 v <sub>R</sub> +	0.0078 V <sub>12</sub> - 0.	00627 L <sub>A</sub>			D <sub>R</sub> =	4.252 + 0	.0086 V <sub>12</sub> - 0	.009 L <sub>D</sub>			
D <sub>R</sub> = 30.0 (p	oc/mi/ln)				D <sub>R</sub> = (p	oc/mi/ =vhihi	'ln) it 13_2)					
LOS - D (Exhibit 13-2) LOS - (Exhibit						rmine4:-						
Speed Det	ermination				Speed L	Jetel		)//				
M <sub>S</sub> = 0.429	(Exibit 13-11)				υ <sub>s</sub> = (Ε		13-12) hihit 40,400					
S <sub>R</sub> = 58.0 m	$S_R = mph (Exhibit 13-11)$											
S <sub>0</sub> = 64.4 m	nph (Exhibit 13-11)				S₀= m	iph (Ex	(nibit 13-12)					
S = 60.0 m	ph (Exhibit 13-13)				S= m	iph (Ex	hibit 13-13)					

	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst			Highway/Direction of Travel	1-95 SB	et WR On & ER On
Agency or Company	AECOM		From/To	Ramps	
Date Performed Analysis Time Period	AM		Jurisdiction Analysis Year	No-Build	1 2040
Project Description SW 10	th Street SIMR				
✓ Oper.(LOS	5)		Des.(N)	🗌 Pla	anning Data
Flow Inputs					
Volume, V	5600	veh/h	Peak-Hour Factor, PHF	0.95	
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	3	
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	0	
Peak-Hr Direction Prop, D		h. /h.	General Terrain:	Level	
DDHV = AADT X K X D		ven/n	Grade % Length	ті	
Oslavilata Elava Adivat			Op/Down 70		
Calculate Flow Adjust	ments				
f <sub>p</sub>	1.00		E <sub>R</sub>	1.2	
Ε <sub>T</sub>	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 <sub>LW</sub>		mph
Number of Lanes, N	3		f <sub>LC</sub>		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS	3	mph			•
LOS and Performance	Measures		Design (N)		
			Design (N)		
Operational (LOS)			Design LOS		
v <sub>p</sub> = (V or DDHV) / (PHF x N	l x f <sub>HV</sub> x f <sub>p</sub> ) 1994	pc/h/ln	$v_{\mu} = (V \text{ or } DDHV) / (PHF x N x)$	f.,, x f.)	pc/h/ln
S	62.7	mph	s s	ну р⁄	mph
$D = v_p / S$	31.8	pc/mi/ln	D = y / S		nc/mi/ln
LOS	D		Required Number of Lanes, N		pormin
Glossary			Factor Location		
	C Crood				
	S - Speed		E <sub>R</sub> - Exhibits 11-10, 11-12		f <sub>LW</sub> - Exhibit 11-8
v - Houriy volume	D - Density		E <sub>T</sub> - Exhibits 11-10, 11-11, 11-	-13	f <sub>LC</sub> - Exhibit 11-9
v <sub>p</sub> - Flow rate	FFS - Free-flow	speed	f <sub>n</sub> - Page 11-18		TRD - Page 11-11
LUS - Level of service	BFFS - Base fre	ee-tiow speed	LOS, S, FFS, v <sub>p</sub> - Exhibits 11-	2, 11-3	-
ויוש - אווש - אווש - אווש - אווש					

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		F	REEWAY	WEAV	ING WOF	RKSHEE	Г		
General	Informatio	on			Site Info	rmation			
Analyst Agency/Con Date Perforr Analysis Tim	npany ned ne Period	AECO AM	М		Freeway/Dir Weaving Seg Analysis Yea	of Travel gment Locatio	I-95 S on Seg 6 No-B	SB 5- Bet Hillsbor uild 2040	ro & 10th St
Project Desc	cription SW 10th	n Street SIMF	2						
Inputs					1				
Weaving con Weaving nu Weaving seg Freeway free	nfiguration mber of lanes, N gment length, L <sub>s</sub> ə-flow speed, FF	-S		One-Sided 4 1830ft 70 mph	Segment typ Freeway min Freeway ma: Terrain type	e imum speed, ximum capac	, S <sub>MIN</sub> ity, C <sub>IFL</sub>		Freeway 15 2400 Leve
Convers	sions to po	/h Unde	r Base Co	ondition	S		•		
	V (veh/h)	PHF	Truck (%)	RV (%)	Ε <sub>Τ</sub>	E <sub>R</sub>	f <sub>HV</sub>	fp	v (pc/h)
V <sub>FF</sub>	4180	0.95	3	0	1.5	1.2	0.985	1.00	4466
V <sub>RF</sub>	890	0.92	2	0	1.5	1.2	0.990	1.00	977
V <sub>FR</sub>	1420	0.92	2	0	1.5	1.2	0.990	1.00	1559
V <sub>RR</sub>	0	0.95	0	0	1.5	1.2	1.000	1.00	0
V <sub>NW</sub>	4466							V =	7002
V <sub>W</sub>	2536								
VR	0.362								
Configu	ration Cha	racteris	tics		•				
Minimum m	aneuver lanes, N	N <sub>WL</sub>		2 lc	Minimum we	aving lane cl	nanges, LC <sub>MIN</sub>	I	lc/h
Interchange	density, ID			0.7 int/mi	Weaving lan	e changes, L	.C <sub>w</sub>		lc/h
Minimum R	= lane changes,	LC <sub>RF</sub>		1 lc/pc	Non-weaving	g lane chang	es, LC <sub>NW</sub>		lc/h
Minimum FF	R lane changes,	$LC_{FR}$		0 lc/pc	Total lane ch	nanges, LC <sub>ALI</sub>	L		lc/h
Minimum RI	R lane changes,	LC <sub>RR</sub>		lc/pc	Non-weaving	g vehicle inde	ex, I <sub>NW</sub>		
Weaving	g Segment	Speed,	Density, I	_evel of	Service,	and Cap	oacity		
Weaving se Weaving se	gment flow rate, gment capacity,	v c <sub>w</sub>		6911 veh/h 6529 veh/h	Weaving inte Weaving seg	ensity factor, gment speed	W , S		mph
Weaving se	gment v/c ratio			1.058	Average wea	aving speed,	Sw		mph
Weaving se	gment density, [	)		pc/mi/ln	Average nor	n-weaving sp	eed, S <sub>NW</sub>		mph
Level of Ser	vice, LOS			F	Maximum we	eaving length	i, L <sub>max</sub>		6260 ft
<b>Notes</b> a. Weaving se Chapter 13, " b. For volume	egments longer th Freeway Merge a es that exceed the	nan the calcula nd Diverge Se weaving seg	ated maximum le egments". ment capacity, th	ength should l	be treated as is vice is "F".	solated merge	and diverge ar	eas using the	procedures of

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	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed	AECOM		Highway/Direction of Travel From/To Jurisdiction	l-95 SB Seg 7-Bo	et Off & On Ramp
Analysis Time Period	AM		Analysis Year	No-Build	2040
Project Description SW 10th	Street SIMR				
✓ Oper.(LOS)			Des.(N)	Pla	inning Data
Volume, V AADT	5070	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub>	0.95 3	
Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	%RVs, P <sub>R</sub> General Terrain: Grade % Length Up/Down %	0 Level mi	
Calculate Flow Adjustm	nents				
f <sub>p</sub>	1.00		E <sub>R</sub>	1.2	
E <sub>T</sub>	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	fux		mph
Number of Lanes, N	3		f <sub>LC</sub>		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 <sub>p</sub> = (V or DDHV) / (PHF x N x S D = v <sub>p</sub> / S LOS	x f <sub>HV</sub> x f <sub>p</sub> ) 1806 65.7 27.5 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 <sub>HV</sub> x f <sub>p</sub> )	pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base fre ur volume	speed ee-flow speed	E <sub>R</sub> - Exhibits 11-10, 11-12 E <sub>T</sub> - Exhibits 11-10, 11-11, 11- f <sub>p</sub> - Page 11-18 LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2	-13 2, 11-3	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-11

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		RAI	MPS AND	RAMP JUN	CTIONS W	ORKSH	EET				
General Ir	nforma	ation			Site Infor	mation					
Analyst Agency or Com Date Performed Analysis Time I	ipany d Period	AEC AM	МС	F J J A	reeway/Dir of Tr unction urisdiction nalysis Year	avel	I-95 S Seg 8 No-Bu	B -Merge from iild 2040	n 10th St		
Project Descrip	tion SV	/ 10th Stree	t SIMR								
Inputs											
Upstream Adj F	Ramp		Freeway Num Ramp Numbe	ber of Lanes, N r of Lanes, N	3 1					Downstrea Ramp	am Adj
✓Yes	On		Acceleration L	ane Length, L <sub>A</sub>	1470					□ Yes	🗌 On
No 🖸	✓ Off		Deceleration I Freeway Volu	Lane Length L <sub>D</sub> me, V <sub>F</sub>	5070					✓ No	Off
L <sub>up</sub> = 22	210 ft		Ramp Volume Freeway Free	e, V <sub>R</sub> -Flow Speed, S <sub>⊏⊏</sub>	1550 70.0					L <sub>down</sub> =	π
$V_u = 14$	420 veh	/h	Ramp Free-Fl	ow Speed, S <sub>FR</sub>	50.0					V <sub>D</sub> =	veh/h
Conversio	on to p	oc/h Und	der Base	Conditions		<del></del>	_				
(pc/h)		V (Veh/hr)	PHF	Terrain	%Truck	%Rv		f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF	x f <sub>HV</sub> x f <sub>p</sub>
Freeway		5070	0.95	Level	3	0	0	).985	1.00	5	417
Ramp		1550	0.92	Level	2	0	0	).990	1.00	1	702
UpStream		1420	0.92	Level	2	0	0	).990	1.00	1	559
DownStream			Merce Areas					 	)iverne Areas		
Estimatio	n of v	12				Estimat	ion d	of v <sub>12</sub>	Neige Aleus		
		V <sub>12</sub> = V <sub>F</sub>	(P <sub>FM</sub> )					V - Y	(1 + 1)	\D	
L <sub>EO</sub> =		2389.15	6 (Equation	13-6 or 13-7)		_		v <sub>12</sub> –	VR ' (VF <sup>-</sup> VR	パ FD 10 cm 10 1	2)
		0.607	using Equat	ion (Exhibit 13-6	)	EQ -		(	Equation 13-		3)
V <sub>40</sub> =		3289	oc/h		,	FD T		ı	using Equatio	on (Exhibit 13	)-7)
$V_3$ or $V_{av34}$		2128	pc/h (Equati	on 13-14 or 13	-	$V_{12} = V_3 \text{ or } V_{av34}$		I	oc/h pc/h (Equation 1	13-14 or 13-1	7)
Is V <sub>3</sub> or V <sub>av34</sub> >	> 2,700 p	c/h? 🗌 Ye	s 🗹 No			Is V <sub>3</sub> or V <sub>av</sub>	<sub>34</sub> > 2,	700 pc/h?	Yes No		
Is V <sub>3</sub> or V <sub>av34</sub> >	> 1.5 * V <sub>1</sub>	<sub>2</sub> /2	s 🔲 No oc/b (Equati	on 13-16 13-		Is V <sub>3</sub> or V <sub>av</sub>	<sub>.34</sub> > 1.: =	5 * V <sub>12</sub> /2 [	∃Yes  ∐ No oc/h (Equatio	n 13-16, 13	3-18, or
If Yes,V <sub>12a</sub> =		18, or	13-19)			12a		1:	3-19)		
Capacity	Check	S				Capacit	y Ch	necks			
		Actual	C	apacity	LOS F?			Actual	Ca	pacity	LOS F?
						V <sub>F</sub>			Exhibit 13-	8	
V <sub>FO</sub>		7119	Exhibit 13-8		No	$V_{FO} = V_F$	- V <sub>R</sub>		Exhibit 13- Exhibit 13	8	
						V <sub>R</sub>			10		
Flow Ente	ering N	lerge In	fluence A	rea	1	Flow Er	<u>iterii</u>	ng Dive	rge Influer	ice Area	
		Actual	Max	Desirable	Violation?		_	Actual	Max Des	irable	Violation?
V <sub>R12</sub>		4991	Exhibit 13-8	4600:All	Yes	V <sub>12</sub>			Exhibit 13-8		
Level of S	Service	e Detern	nination (	if not F)		Level of	f Ser	vice De	terminatio	on (if not	F)
D <sub>R</sub> = 5.4	475 + 0.0	0734 v <sub>R</sub> + (	0.0078 V <sub>12</sub> - 0.0	00627 L <sub>A</sub>			D <sub>R</sub> =	4.252 + 0	.0086 V <sub>12</sub> - 0	.009 L <sub>D</sub>	
D <sub>R</sub> = 34.4	(pc/mi/ln)	2)				D <sub>R</sub> = (p	oc/mi/ =vhihi	'ln) it 13-2)			
	tormi-	-, otion						mincti-			
Sheen De								12 10	//1		
M <sub>S</sub> = 0.748	8 (Exibit 1	3-11)				υ <sub>s</sub> – (Ε ς –		10-12)			
S <sub>R</sub> = 49.1	mph (Exh	nibit 13-11)				o <sub>R</sub> − m	ipn (Ex	midit 13-12)			
S <sub>0</sub> = 64.1	mph (Exł	nibit 13-11)				5 <sub>0</sub> = m	iph (Ex	(nibit 13-12)			
S = 52.8	mph (Exh	nibit 13-13)				S= m	iph (Ex	hibit 13-13)			

	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed	AECOM		Highway/Direction of Travel From/To Jurisdiction	l-95 SB Seg 9-Be	et 10th & Exit to Exp
Analysis Time Period	AM		Analysis Year	No-Build	2040
Project Description SW 10th	Street SIMR				
Oper.(LOS)			Des.(N)	□Pla	inning Data
Flow Inputs					
Volume, V AADT	6620	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub>	0.95 3	
Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	%RVs, P <sub>R</sub> General Terrain: Grade % Length Up/Down %	0 Level mi	
Calculate Flow Adjustm	nents				
f <sub>p</sub>	1.00		E <sub>R</sub>	1.2	
E <sub>T</sub>	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
Speed Inputs			Calc Speed Adj and FFS	3	
Lane Width Rt-Side Lat. Clearance		ft ft	f <sub>LW</sub>		mph
Number of Lanes, N	3	, .			mph
FFS (measured) Base free-flow Speed, BFFS	70.0	ramps/mi mph mph	FFS	70.0	mpn mph
LOS and Performance I	Measures		Design (N)		
<u>Operational (LOS)</u> v <sub>p</sub> = (V or DDHV) / (PHF x N x S D = v <sub>p</sub> / S LOS	( f <sub>HV</sub> x f <sub>p</sub> ) 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 <sub>HV</sub> x f <sub>p</sub> )	pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base fre ur volume	speed e-flow speed	E <sub>R</sub> - Exhibits 11-10, 11-12 E <sub>T</sub> - Exhibits 11-10, 11-11, 11- f <sub>p</sub> - Page 11-18 LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2	13 2, 11-3	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - 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 Compan	y AECO	ОМ	Ju	nction		Seg 10	- Diverge t	o Express		
Date Performed			Ju	risdiction		-	-			
Analysis Time Peric	od AM		An	alysis Year		No-Bui	ld 2040			
Project Description	SW 10th Stree	t SIMR								
Inputs		1								
Upstream Adi	Ramp	Freeway Nun	nber of Lanes, N	3					Downstrea	m Adi
	- F	Ramp Numbe	er of Lanes, N	1					Ramp	· <b>,</b>
✓ Yes	🗹 On	Acceleration	Lane Length, L							
		Deceleration	l ane l ength l	300						
	O <del>ff</del>	Erooway Volu		6600					🗹 No	Off
	000 #		ine, v <sub>F</sub>	0020					I. =	ft
Lup 0		Ramp volum	e, v <sub>R</sub>	950					-down	
V = 1	550 veh/h	Freeway Free	e-Flow Speed, S <sub>FF</sub>	70.0					V <sub>D</sub> =	veh/h
<sup>-</sup> u '		Ramp Free-F	low Speed, S <sub>FR</sub>	45.0						
Conversion	to pc/h Und	der Base	Conditions							
(nc/h)	V	PHF	Terrain	%Truck	%Rv		f	f	v = V/PHF	x fx f
(po/ii)	(Veh/hr)		Tontain	7011000	/01 (1		·HV	р		HV Tp
Freeway	6620	0.95	Level	3	0	0.	985	1.00	707	73
Ramp	950	0.92	Level	2	0	0.	990	1.00	104	13
UpStream	1550	0.92	Level	2	0	0.	990	1.00	17(	)2
DownStream										
<b>F</b> atimatian a	<b>f</b>	werge Areas			<b>F</b> atimati		L	Diverge Areas		
Estimation o	<sup>of V</sup> 12				Estimati		<sup>r v</sup> 12			
	V <sub>12</sub> = V <sub>F</sub>	( P <sub>FM</sub> )					V <sub>12</sub> =	= V <sub>R</sub> + (V <sub>F</sub> - V	<sub>R</sub> )P <sub>FD</sub>	
	(Equa	ition 13-6 or	13-7)		L <sub>EO</sub> =		1'	1022.53 (Equa	ation 13-12 d	or 13-13)
	usina	Equation (	Exhibit 13-6)				0.	535 usina Ea	uation (Exhib	oit 13-7)
	nc/h				V =		42	270 pc/h	(	
$^{12}$	pc/h	Equation 12	(14  or  12  17)		V or V			202 pc/h (Equ	untion 12 14	or 12 17)
$v_3 0 v_{av34}$	) pc/ii ( ۱۵۵ هم/۱۰۵ هم/		-14 01 13-17)		$a_3$ $a_{av34}$	<u>\</u> 07	20 00 po/b2 T		1811011 13-14	0113-17)
IS $V_3$ or $V_{av34} > 2,7$		s 🗌 No				34 ~ Z,I	* 1 /0			
Is $V_3$ or $V_{av34} > 1.5$	$12^{2}$ $\Box$ Ye	s ∐No			is v <sub>3</sub> or v <sub>av3</sub>	<sub>34</sub> > 1.5	" V <sub>12</sub> /2	Yes Mo		
lf Yes,V <sub>12a</sub> =	pc/h ( 13_10)	Equation 13	3-16, 13-18, or		If Yes,V <sub>12a</sub> =		43	373 pc/h (Equ	ation 13-16	, 13-18,
Capacity Ch					Canacit	v Ch	ocks	113-19)		
	Actual		) anaoit <i>u</i>				Actual		ano oitu	
	Actual			LUGF?	V		Actual			
					V <sub>F</sub>		7073	Exhibit 13-	8 7200	NO
V <sub>FO</sub>		Exhibit 13-8			$V_{FO} = V_{F}$	- V <sub>R</sub>	6030	Exhibit 13-	8 7200	No
					V <sub>R</sub>		1043	Exhibit 13-1	10 2100	No
Flow Enterin	ng Merge In	fluence A	Area	-	Flow En	terin	g Dive	rge Influen	ice Area	
	Actual	Max	Desirable	Violation?			Actual	Max Desira	ble	Violation?
V <sub>R12</sub>		Exhibit 13-8			V <sub>12</sub>	4	1270	Exhibit 13-8	4400:All	No
Level of Ser	vice Detern	nination	(if not F)		Level of	Ser	vice De	terminatio	n (if not F	=)
D = 5475 + 0	0.00734 v + 1	0 0078 V	- 0.006271			D = 4	252 + 0	0086 V = 0	0091	/
$D_{\rm R} = (n_{\rm R}/m_{\rm H})^{-1}$	n)	0.0070 12	0.00027 LA		D - 44	R	/	.0000 12 0	.000 L <sub>D</sub>	
$D_R = (pc/m/n)$	(1)				0 <sub>R</sub> = 41	.0 (pc	((11/11))			
LOS = (Exhibit	: 13-2)				LOS = E	(Exhil	oit 13-2)			
Speed Deter	mination				Speed D	)eter	minatio	on		
M <sub>s</sub> = (Exibit 1	13-11)				D <sub>s</sub> = 0.3	392 (E	xhibit 13	-12)		
$S_{p} = mnh (Fx)$	, hibit 13-11)				S <sub>R</sub> = 59	.0 mph	(Exhibit	13-12)		
$S_{a} = mnh (Ev)$	hihit 13_11)				S <sub>0</sub> = 71	.0 mph	(Exhibit	13-12)		
S = mnh (Fx)	hibit 13-13)				S = 62	7 mnh	(Exhibit	13-13)		
		lighte Decenie d						10 10)	Concratad: 5"	00/0010 40.00
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	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst			Highway/Direction of Travel	I-95 SB	Bet Off Evp Off
Agency or Company	AECOM		From/To	Samples	S
Date Performed Analysis Time Period	AM		Jurisdiction Analysis Year	No-Build	1 2040
Project Description SW 10	th Street SIMR				
🗹 Oper.(LOS	)		Des.(N)	🗌 Pla	anning Data
Flow Inputs					
Volume, V	5670	veh/h	Peak-Hour Factor, PHF	0.95	
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	3	
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	0	
Peak-Hr Direction Prop, D		a sa la dla	General Terrain:	Level	
DDHV = AADT X K X D		ven/n	Grade % Length	ті	
Oslavilata Elava Adivat			Op/Down 70		
Calculate Flow Adjust	ments				
f <sub>p</sub>	1.00		E <sub>R</sub>	1.2	
E <sub>T</sub>	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 <sub>LW</sub>		mph
Number of Lanes, N	3		f <sub>LC</sub>		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 <sub>p</sub> = (V or DDHV) / (PHF x N	x f <sub>HV</sub> x f <sub>p</sub> ) 2019	pc/h/ln	$v_{-} = (V \text{ or } DDHV) / (PHF x N x)$	(f <sub>11</sub> , x f <sub>2</sub> )	pc/h/ln
S	62.2	mph	S	ну р	mph
$D = v_p / S$	32.4	pc/mi/ln	D = v / S		nc/mi/ln
LOS	D		Required Number of Lanes, N		portium
Glossary			Factor Location		
	S Spood				
	D Donoity		E <sub>R</sub> - Exhibits 11-10, 11-12		f <sub>LW</sub> - Exhibit 11-8
v - Hourry volume	EFS From flow	speed	E <sub>T</sub> - Exhibits 11-10, 11-11, 11-	-13	f <sub>LC</sub> - Exhibit 11-9
		speed	f <sub>p</sub> - Page 11-18		TRD - Page 11-11
LUS - Level OT Service	our volume	e-now speed	LOS, S, FFS, v <sub>p</sub> - Exhibits 11-	2, 11-3	

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		RAMP	S AND RAM	P JUNCTI	ONS WO	RKS	HEET			
General Infor	mation			Site Infor	mation					
Analyst			Fre	eeway/Dir of Tra	avel	I-95 SE	}			
Agency or Company	AECO	DM	Ju	nction		Seg 12	- Diverge to	o Sample Rd		
Date Performed			Ju	risdiction		-	-			
Analysis Time Period	MA b		An	alysis Year		No-Bui	ld 2040			
Project Description	SW 10th Street	t SIMR								
Inputs		1								
Upstream Adi R	amp	Freeway Num	nber of Lanes, N	3					Downstrea	m Adi
		Ramp Numbe	er of Lanes, N	1					Ramp	· <b>,</b>
Yes 🗌	On	Acceleration	Lane Length, L							
	7	Deceleration	l ane l ength l	250						
No 🖻	⊿ Off	Erooway Volu		£670					🗹 No	Off
1 - 20	00 <del>ft</del>		ine, v <sub>F</sub>	5070					I. =	ft
Lup 20	100 IL	Ramp volume	e, v <sub>R</sub>	1050					-down	
V = 95	0 veh/h	Freeway Free	e-Flow Speed, S <sub>FF</sub>	70.0					V <sub>D</sub> =	veh/h
		Ramp Free-F	low Speed, S <sub>FR</sub>	45.0					D	
Conversion t	o pc/h Und	ler Base	Conditions							
(nc/h)	V	PHF	Terrain	%Truck	%Bv		f	f	v = V/PHF	x fx f
(po/ii)	(Veh/hr)		Terrain	7011UCK	/01.00		'HV	'p	• •/1 111	Y'HV Y'p
Freeway	5670	0.95	Level	3	0	0.	985	1.00	605	58
Ramp	1050	0.92	Level	2	0	0.	990	1.00	115	53
UpStream	950	0.92	Level	2	0	0.	990	1.00	104	13
DownStream										
	<u>ا</u>	Merge Areas				-	<u> </u>	Diverge Areas		
Estimation of	r v <sub>12</sub>				Estimat	ion o	t v <sub>12</sub>			
	$V_{12} = V_{F}$	(P <sub>FM</sub> )					V <sub>12</sub> =	· V <sub>R</sub> + (V <sub>F</sub> - V	′ <sub>R</sub> )P <sub>FD</sub>	
	(Equa	tion 13-6 or	13-7)		L <sub>E0</sub> =		(	Equation 13-	12 or 13-13)	
P=	usina	Equation (	Fxhibit 13-6)				0	556 Usina Fa	, Juation (Exhib	nit 13-7)
V=	nc/h				V =		30	878 nc/h		
12	pc/h	Equation 12	(14  or  12 17)		<sup>v</sup> 12 V or V		04	00 pc/li		an 40 47)
$v_3 0 v_{av34}$	pc/ii (i		-14 01 13-17)		v <sub>3</sub> 01 v <sub>av34</sub>		ا Z	180 pc/n (Equ	Jation 13-14	or 13-17)
IS $V_3$ or $V_{av34} > 2.70$		6 <u> </u>			IS V <sub>3</sub> Or V <sub>av</sub>	<sub>34</sub> > 2,1		_Yes ⊻No		
Is $V_3$ or $V_{av34} > 1.5$	* V <sub>12</sub> /2	s 🗌 No			Is V <sub>3</sub> or V <sub>av</sub>	<sub>34</sub> > 1.5	* V <sub>12</sub> /2	Yes 🗹 No		
lf Yes,V <sub>12a</sub> =	pc/h (l 13 10)	Equation 13	3-16, 13-18, or		If Yes,V <sub>12a</sub> =	=	p	c/h (Equation	n 13-16, 13-	18, or 13-
Canacity Cho	13-19)				Canacit	v Ch		9)		
	Actual		) anaoit <i>u</i>		T	<u>y Cin</u>	Actual		on o oitr	
	Actual		зарасну	LUGF?			Actual			LUGF?
					V <sub>F</sub>	<u> </u>	0000	EXIIIDIL 13-	0 7200	INO
V <sub>FO</sub>		Exhibit 13-8			$V_{FO} = V_{F}$	- V <sub>R</sub>	4905	Exhibit 13-	·8 7200	No
					V <sub>R</sub>		1153	Exhibit 13-	10 2100	No
Flow Entering	g Merge In	fluence A	Area		Flow En	terin	g Dive	rge Influer	nce Area	
	Actual	Max	Desirable	Violation?			Actual	Max Desira	ble	Violation?
V <sub>R12</sub>		Exhibit 13-8			V <sub>12</sub>		3878	Exhibit 13-8	4400:All	No
Level of Serv	ice Detern	nination (	(if not F)		Level of	F Serv	/ice De	terminatio	n (if not F	=)
$D_{\rm p} = 5.475 \pm 0.100$	00734 v = + 0	0.0078 V.	- 0.00627   .			$D_{-} = 4$	252 + 0	.0086 V 0	.0091	/
D = (no/mi/ln	N R R	12			D - 27	-R 70 (no	/	12		
$D_R = (pc/m/m)$	I)				$D_{\rm R} = 37$	.u (pc	(111/111)			
LOS = (Exhibit	13-2)				LOS = E	(Exhit	oit 13-2)			
Speed Deterr	nination				Speed L	Deter	minatic	on		
M <sub>s</sub> = (Exibit 1)	3-11)				D <sub>s</sub> = 0.4	402 (E	xhibit 13-	·12)		
$S_{p} = mph (Fxh)$	nibit 13-11)				S <sub>R</sub> = 58	3.8 mph	(Exhibit	13-12)		
S= mnh (Evh	whit $13_{11}$				S <sub>0</sub> = 72	2.9 mph	(Exhibit	13-12)		
S = mnh (Evh	13-13				S = 60	) 8 mnh	(Evhibit	, 13-13)		
		ights Boost of						10-10)	Concratad: 5"	00/0010 10.44
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	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed	AECOM		Highway/Direction of Travel From/To Jurisdiction	l-95 SB Seg 13-L	Bet Off & On Ramps
Analysis Time Period	AM		Analysis Year	No-Build	1 2040
Project Description SW 10t	h Street SIMR				
✓ Oper.(LOS)			Des.(N)		inning Data
<i>Flow inputs</i>	(000				
Volume, V AADT	4620	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub>	0.95 3	
Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	%RVs, P <sub>R</sub> General Terrain: Grade % Length Up/Down %	0 Level mi	
Calculate Flow Adjustr	ments				
f <sub>p</sub>	1.00		E <sub>R</sub>	1.2	
Ε <sub>T</sub>	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		ft ft	f <sub>LW</sub>		mph
Number of Lanes, N Total Ramp Density, TRD	3	ramps/mi	f <sub>LC</sub> 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 <sub>p</sub> = (V or DDHV) / (PHF x N S D = v <sub>p</sub> / S LOS	x f <sub>HV</sub> x f <sub>p</sub> ) 1645 67.7 24.3 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 <sub>HV</sub> x f <sub>p</sub> )	pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base free our volume	speed ee-flow speed	E <sub>R</sub> - Exhibits 11-10, 11-12 E <sub>T</sub> - Exhibits 11-10, 11-11, 11- f <sub>p</sub> - Page 11-18 LOS, S, FFS, v <sub>p</sub> - Exhibits 11-	-13 2, 11-3	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-11

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			REEWA	Y WEAV	ING WOF	RKSHEE	Т		
Genera	I Informatio	on			Site Info	ormation			
Analyst Agency/Co Date Perfor Analysis Tir	mpany rmed me Period	AECO AM	М		Freeway/Dir Weaving Sey Analysis Yea	of Travel gment Locati ar	I-95 S on Seg 1 No-Bu	B 4- Bet Sampl uild 2040	e & Copa
Project Des	scription SW 10th	n Street SIMF	2						
Inputs					•				
Weaving co Weaving nu Weaving se Freeway fre	onfiguration umber of lanes, N egment length, L <sub>s</sub> ee-flow speed, FF	S		One-Sided 4 1650ft 70 mph	Segment typ Freeway mir Freeway ma Terrain type	e nimum speed ximum capad	l, S <sub>MIN</sub> city, C <sub>IFL</sub>		Fre
Conver	sions to po	:/h Unde	r Base Co	ondition	<u>s</u>				
	V (veh/h)	PHF	Truck (%)	RV (%)	Ε <sub>Τ</sub>	E <sub>R</sub>	f <sub>HV</sub>	fp	v (pc
V <sub>FF</sub>	3915	0.95	3	0	1.5	1.2	0.985	1.00	4183
V <sub>RF</sub>	1970	0.92	2	0	1.5	1.2	0.990	1.00	216
V <sub>FR</sub>	705	0.92	2	0	1.5	1.2	0.990	1.00	774
V <sub>RR</sub>	0	0.95	0	0	1.5	1.2	1.000	1.00	0
V <sub>NW</sub>	4183							V =	712
V <sub>W</sub>	2937								
VR	0.412								
Config	uration Cha	racteris	tics		r				
Minimum n	naneuver lanes, N	N <sub>WL</sub>		2 lc	Minimum we	eaving lane c	hanges, LC <sub>MIN</sub>		
Interchang	e density, ID			0.7 int/mi	Weaving lar	ie changes, l	_C <sub>w</sub>		
Minimum F	RF lane changes,	LC <sub>RF</sub>		1 lc/pc	Non-weavin	g lane chang	jes, LC <sub>NW</sub>		
Minimum F	R lane changes,	$LC_{FR}$		1 lc/pc	Total lane cl	hanges, LC <sub>AL</sub>	L		
Minimum F	RR lane changes,	LC <sub>RR</sub>		lc/pc	Non-weavin	g vehicle ind	ex, I <sub>NW</sub>		
Weavin	ig Segment	Speed,	Density, I	Level of	Service,	and Ca	pacity		
Weaving so Weaving so	egment flow rate, egment capacity,	v c <sub>w</sub>		7029 veh/h 5732 veh/h	Weaving interview weaving set	ensity factor, gment speed	W I, S		
Weaving s	egment v/c ratio	_		1.226	Average we	aving speed,	Sw		
Weaving s	egment density, [	)		pc/mi/ln	Average nor	n-weaving sp	beed, $S_{NW}$		
	EI VICE, LUS			F	Maximum w	eaving lengtl	n, L <sub>MAX</sub>		6
Notes	segments longer th	an the colouir	ted maximum k	anoth chould	he treated as it	solated mores	and divorgo or	and using the	procedure
chapter 13,	"Freeway Merge a	nd Diverge Se	egments".	he level of so	vice is "F"	solateu merge	anu uiverge ar	eas using the	procedure
	roity of Florido, All	Dights Deserve	ad			10TM Version	- C 00	Gene	erated: 5/

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	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed	AECOM		Highway/Direction of Travel From/To Jurisdiction	I-95 SB Seg 1-B	et Hillsboro & Palmetto
Analysis Time Period	PM		Analysis Year	No-Build	1 2040
Project Description SW 10	th Street SIMR				
Oper.(LOS	5)		Des.(N)	Pla	anning Data
Flow Inputs					
Volume, V AADT	5150	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub>	0.95 3	
Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	%RVs, P <sub>R</sub> General Terrain: Grade % Length Up/Down %	0 Level mi	
Calculate Flow Adjust	ments				
f <sub>p</sub>	1.00		E <sub>R</sub>	1.2	
Ε <sub>T</sub>	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
Speed Inputs			Calc Speed Adj and FFS	3	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f <sub>LW</sub>		mph
Number of Lanes, N	3		f <sub>LC</sub>		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS	3	mph			
LOS and Performance	Measures		Design (N)		
<u>Operational (LOS)</u> v <sub>p</sub> = (V or DDHV) / (PHF x N S D = v <sub>p</sub> / S LOS	x f <sub>HV</sub> x f <sub>p</sub> ) 1834 65.3 28.1 D	pc/h/ln mph pc/mi/ln	Design (N) Design LOS v <sub>p</sub> = (V or DDHV) / (PHF x N x S D = v <sub>p</sub> / S Required Number of Lanes, N	f <sub>HV</sub> x f <sub>p</sub> )	pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service DDHV - Directional design h	S - Speed D - Density FFS - Free-flow BFFS - Base fre our volume	speed ee-flow speed	E <sub>R</sub> - Exhibits 11-10, 11-12 E <sub>T</sub> - Exhibits 11-10, 11-11, 11- f <sub>p</sub> - Page 11-18 LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2	13 2, 11-3	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-11

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			REEWA	Y WEAV	ING WOF	RKSHEE	T		
Genera	I Informatio	on			Site Info	ormation			
Analyst Agency/Co Date Perfor Analysis Ti	mpany rmed me Period	AECO PM	М		Freeway/Dir Weaving Se Analysis Yea	of Travel gment Locati ar	I-95 S on Seg 2 No-B	SB 2-Bet On from uild 2040	Exp & Of
Project Des	scription SW 10th	n Street SIMF	२						
Inputs									
Weaving co Weaving nu Weaving se Freeway fre	onfiguration umber of lanes, N egment length, L <sub>s</sub> ee-flow speed, FF	S		Two-Sided 3 5085ft 70 mph	Segment typ Freeway mir Freeway ma Terrain type	e nimum speed ximum capad	l, S <sub>MIN</sub> city, C <sub>IFL</sub>		Fre
Conver	sions to po	/h Unde	r Base Co	ondition	s			-	
	V (veh/h)	PHF	Truck (%)	RV (%)	E <sub>T</sub>	E <sub>R</sub>	f <sub>HV</sub>	fp	v (pc/
V <sub>FF</sub>	4010	0.95	3	0	1.5	1.2	0.985	1.00	4284
V <sub>RF</sub>	1460	0.92	2	0	1.5	1.2	0.990	1.00	1603
V <sub>FR</sub>	1140	0.92	2	0	1.5	1.2	0.990	1.00	1252
V <sub>RR</sub>	130	0.92	2	0	1.5	1.2	0.990	1.00	143
V <sub>NW</sub>	7139							V =	728
V <sub>W</sub>	143								
VR	0.020								
Config	uration Cha	racteris	tics						
Minimum n	naneuver lanes, N	N <sub>WL</sub>		0 lc	Minimum we	eaving lane c	hanges, LC <sub>MIN</sub>	1	
Interchang	e density, ID			0.7 int/mi	Weaving lar	ne changes, l	_C <sub>w</sub>		
Minimum F	RF lane changes,	$LC_{RF}$		0 lc/pc	Non-weavin	g lane chang	jes, LC <sub>NW</sub>		
Minimum F	R lane changes,	$LC_{FR}$		0 lc/pc	Total lane c	hanges, LC <sub>AL</sub>	L		
Minimum F	RR lane changes,	LC <sub>RR</sub>		3 lc/pc	Non-weavin	g vehicle ind	ex, I <sub>NW</sub>		
Weavin	ig Segment	Speed,	Density,	Level of	Service,	and Ca	pacity		
Weaving s Weaving s	egment flow rate, egment capacity,	v c <sub>w</sub>		7189 veh/h 6907 veh/h	Weaving int Weaving se	ensity factor, gment speed	W I, S		
Weaving s	egment v/c ratio	_		1.041	Average we	aving speed,	3 <sub>W</sub>		
Weaving s	egment density, [ anvice 1 OS	J		pc/mi/ln ⊢	Average no	n-weaving sp	eea, S <sub>NW</sub>		
	EIVICE, LUS			F	Maximum w	eaving lengtl	n, L <sub>MAX</sub>		59
NOTES	segments longer th	an the colouir		anath should	he treated as it	colated morac	and divorce of	oge using the	procedure
Chapter 13,	"Freeway Merge a	nd Diverge Se	egments".	he level of se	nvice is "F"	solateu merge	anu uiveiye al	eas using the	procedule
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	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed	AECOM		Highway/Direction of Travel From/To Jurisdiction	l-95 SB Seg 3-B	et Off & On Ramp
Analysis Time Period	PM		Analysis Year	No-Build	1 2040
Project Description SW 10t	h Street SIMR				
✓ Oper.(LOS)			Des.(N)	Pla	anning Data
Flow Inputs					
Volume, V AADT	5470	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub>	0.95 3	
Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	%RVs, P <sub>R</sub> General Terrain: Grade % Length Up/Down %	0 Level mi	
Calculate Flow Adjustr	nents				
f <sub>p</sub>	1.00		E <sub>R</sub>	1.2	
Ε <sub>T</sub>	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
Speed Inputs			Calc Speed Adj and FFS	3	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f <sub>LW</sub>		mph
Number of Lanes, N	3		T <sub>LC</sub>		mph
	70.0	ramps/mi		70.0	mpn
FFS (measured)	70.0	mph	FFS	70.0	mph
		шрп	<b>-</b>		
LOS and Performance	Measures		Design (N)		
<u>Operational (LOS)</u> v <sub>p</sub> = (V or DDHV) / (PHF x N S D = v <sub>p</sub> / S LOS	x f <sub>HV</sub> x f <sub>p</sub> ) 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 <sub>HV</sub> x f <sub>p</sub> )	pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base free our volume	speed ee-flow speed	E <sub>R</sub> - Exhibits 11-10, 11-12 E <sub>T</sub> - Exhibits 11-10, 11-11, 11- f <sub>p</sub> - Page 11-18 LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2	13 2, 11-3	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-11

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Site Information         Freeway/Dir of Travel       I-95 SB         Junction       Seg 4-Merge from Hillsboro WB         Jurisdiction       Seg 4-Merge from Hillsboro WB	} Merge from Hillsboro WB		
Freeway/Dir of Travel I-95 SB Junction Seg 4-Merge from Hillsboro WB Jurisdiction	3 Merge from Hillsboro WB		
Junction Seg 4-Merge from Hillsboro WB Jurisdiction	Merge from Hillsboro WB		
Jurisdiction		erge from Hillsboro WB	
Analysis Year No-Build 2040	ld 2040	2040	
		1	
eway Number of Lanes, N 3 Down	Downstrea	Downstream /	Adj
np Number of Lanes, N 1 Ramp	Ramp	Ramp	
eleration Lane Length, $L_A$ 950 $\Box$ Ye	🗌 Yes	🗆 Yes 🛛	On
celeration Lane Length L <sub>D</sub>		V No	Off
eway Volume, V <sub>F</sub> 5470			
np Volume, V <sub>R</sub> 890 <sup>L</sup> down <sup>=</sup>	L <sub>down</sub> =	L <sub>down</sub> = ft	t
eway Free-Flow Speed, S <sub>FF</sub> 70.0	V -	V	ah/h
np Free-Flow Speed, S <sub>FR</sub> 50.0	v <sub>D</sub> –	v <sub>D</sub> – ve	en/n
Base Conditions			
PHF Terrain %Truck %Rv $f_{HV}$ $f_{p}$ $v = V_{P}$	f <sub>HV</sub> f <sub>p</sub> v = V/PHF	f <sub>p</sub> v = V/PHF x f	f <sub>HV</sub> x f <sub>p</sub>
0.95 Level 3 0 0.985 1.00	985 1.00 58	85 1.00 5844	···· թ
0.33 Level 2 0 0.990 1.00		0 1.00 977	r
0.92 Level 2 0 0.990 1.00	990 1.00 13	0 1.00 1394	l
		1.00 1004	r
ge Areas Diverge Areas	Diverge Areas	Diverge Areas	
Estimation of v <sub>12</sub>	f v <sub>12</sub>	v <sub>12</sub>	
$M$ ) $\gamma = \gamma + (\gamma - \gamma) P$			
Equation 13-6 or 13-7) $v_{12} = v_R + (v_F - v_R)P_{FD}$	$v_{12} = v_R + (v_F - v_R)P_{FD}$	$v_{12} = v_R + (v_F - v_R)P_{FD}$	
$L_{EQ}$ - (Equation 13-12 of	(Equation 13-12 or 13-13	(Equation 13-12 of 13-13)	
$P_{FD}$ – Using Equation (Exn	using Equation (Exhibit 13-	using Equation (Exhibit 13-7)	
$V_{12} = pc/h$	pc/h	pc/h	
$V_3$ or $V_{av34}$ pc/h (Equation 13-14 or	pc/h (Equation 13-14 or 13-17	pc/h (Equation 13-14 or 13-17)	
No $  sv_3 \text{ or } v_{av34} > 2,700 \text{ pc/h}? Yes No$	00 pc/h? Yes No	) pc/h? Yes No	
$\Box$ No $  s V_3 \text{ or } V_{av34} > 1.5 * V_{12}/2    Yes    No$	* V <sub>12</sub> /2 Yes No	V <sub>12</sub> /2 Yes No	•
(Equation 13-16, 13-	pc/h (Equation 13-16, 13- 13-19)	pc/h (Equation 13-16, 13-18	8, or
19) Canacity Chocks	ocke	rke	
	Actual Capacity	Actual Capacity	
V Exhibit 13.8	Evhibit 13-8	Evhibit 13.8	LUGT
(hibit 13-8 No $V_{FO} - V_F - V_R$ Exhibit 13-8	Exhibit 13-8	Exhibit 13-6	
V <sub>R</sub> Exhibit 13- 10	10	10	
ence Area Flow Entering Diverge Influence A	g Diverge Influence Area	Diverge Influence Area	
Max Desirable Violation? Actual Max Desirable	Actual Max Desirable	tual Max Desirable V	Violation?
hibit 13-8 4600:All No V <sub>12</sub> Exhibit 13-8	Exhibit 13-8	Exhibit 13-8	
ation (if not F) Level of Service Determination (if	vice Determination (if not l	ce Determination (if not F)	
78 $V_{12}$ - 0.00627 $L_A$ $D_R$ = 4.252 + 0.0086 $V_{12}$ - 0.009 $L$	4.252 + 0.0086 V <sub>12</sub> - 0.009 L <sub>D</sub>	252 + 0.0086 V <sub>12</sub> - 0.009 L <sub>D</sub>	
D <sub>R</sub> = (pc/mi/ln)	n)		
LOS = (Exhibit 13-2)	13-2)	3-2)	
Speed Determination	mination	nination	
D <sub>s</sub> = (Exhibit 13-12)	3-12)	12)	
S <sub>R</sub> = mph (Exhibit 13-12)	ibit 13-12)	it 13-12)	
S <sub>0</sub> = mph (Exhibit 13-12)	nibit 13-12)	it 13-12)	
S = mph (Exhibit 13-13)	nibit 13-13)	it 13-13)	
eway Volume, $V_{F}$ 5470       Link         mp Volume, $V_{R}$ 890 $V_{0}$ eway Free-Flow Speed, $S_{FF}$ 70.0 $V_{D}$ mp Free-Flow Speed, $S_{FR}$ 50.0 $V_{D}$ 'Base Conditions	$\frac{F_{HV}}{F_{P}} = \frac{F_{V}}{V_{D}} = \frac{F_{V}}{$	$\frac{1}{V_{D}} = \frac{1}{V_{D}} = $	8, or

	BASIC F	REEWAY SE	GMENTS WORKSHEET		
Concret Information			Site Information		
				105 50	
	450014			Seg 5-B	et WB On & EB On
Agency of Company	AECOM		From/To	Ramps	
Date Performed Analysis Time Period	PM		Jurisdiction Analysis Year	No-Build	1 2040
Project Description SW 10	th Street SIMR				
✓ Oper.(LOS	6)		Des.(N)	🗌 Pla	anning Data
Flow Inputs					
Volume, V	6360	veh/h	Peak-Hour Factor, PHF	0.95	
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	3	
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	0	
Peak-Hr Direction Prop, D		voh/h	General Terrain:	Level	
		ven/n	Grade % Length	m	
Colouloto Flour Adiust					
Calculate Flow Adjust	ments		_		
f <sub>p</sub>	1.00		E <sub>R</sub>	1.2	
Ε <sub>T</sub>	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 <sub>LW</sub>		mph
Number of Lanes, N	3		f <sub>LC</sub>		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS	8	mph			·
LOS and Performance	e Measures		Design (N)		
			Design (N)		
			Design LOS		
$v_p = (V \text{ or DDHV}) / (PHF X N)$	I x f <sub>HV</sub> x f <sub>p</sub> ) 2265	pc/h/ln	$v_{p} = (V \text{ or DDHV}) / (PHF x N x)$	f <sub>HV</sub> x f <sub>n</sub> )	pc/h/ln
S	56.8	mph	S	nv p	mph
$D = v_p / S$	39.8	pc/mi/ln	$D = v_p / S$		pc/mi/ln
LOS	E		Required Number of Lanes, N		·
Glossary			Factor Location		
N - Number of lanes	S - Speed				
V - Hourly volume	D - Densitv		E <sub>R</sub> - Exhibits 11-10, 11-12		t <sub>LW</sub> - Exhibit 11-8
v - Flow rate	FFS - Free-flow	speed	$E_{T}$ - Exhibits 11-10, 11-11, 11-	-13	t <sub>LC</sub> - Exhibit 11-9
LOS - Level of service	BFFS - Base fre	ee-flow speed	f <sub>p</sub> - Page 11-18		TRD - Page 11-11
DDHV - Directional design h	iour volume	-1	LOS, S, FFS, v <sub>p</sub> - Exhibits 11-	2, 11-3	

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		F	REEWA	Y WEAV	ING WOF	RKSHEE	Т		
Genera	al Informati	on			Site Info	rmation			
Analyst Agency/Co Date Perfo Analysis Ti	ompany rmed me Period	AECON PM	И		Freeway/Dir of Travel I-95 SB Weaving Segment Location Seg 6- Bet Hillsboro & 10th St Analysis Year No-Build 2040				
Project De	scription SW 10t	h Street SIMF	2						
Inputs					1				
Weaving c Weaving n Weaving s Freeway fr	onfiguration umber of lanes, N egment length, L ee-flow speed, F	N s FS		One-Sided 4 1830ft 70 mph	Segment typ Freeway min Freeway ma Terrain type	e imum speed ximum capac	, S <sub>MIN</sub> bity, C <sub>IFL</sub>		Freeway 1 2400 Leve
Conve	rsions to p	c/h Unde	r Base Co	ondition	s	1	r		-
	V (veh/h)	PHF	Truck (%)	RV (%)	Ε <sub>Τ</sub>	E <sub>R</sub>	f <sub>HV</sub>	fp	v (pc/h)
V <sub>FF</sub>	4860	0.95	3	0	1.5	1.2	0.985	1.00	5193
V <sub>RF</sub>	830	0.92	2	0	1.5	1.2	0.990	1.00	911
V <sub>FR</sub>	1500	0.92	2	0	1.5	1.2	0.990	1.00	1647
V <sub>RR</sub>	0	0.95	0	0	1.5	1.2	1.000	1.00	0
V <sub>NW</sub>	5193			-		-		V =	7751
V <sub>w</sub>	2558							-	
VR	0.330								
Config	uration Cha	aracterist	tics		•				
Minimum r	maneuver lanes,	N <sub>WL</sub>		2 lc	Minimum we	aving lane cl	hanges, LC <sub>MIN</sub>		lc/h
Interchang	je density, ID			0.7 int/mi	Weaving lan	e changes, L	.C <sub>w</sub>		lc/h
Minimum I	RF lane changes,	LC <sub>RF</sub>		1 lc/pc	Non-weaving	g lane chang	es, LC <sub>NW</sub>		lc/h
Minimum I	R lane changes,	LC <sub>FR</sub>		0 lc/pc	Total lane cl	nanges, LC <sub>AL</sub>	L		lc/h
Minimum I	RR lane changes	, LC <sub>RR</sub>		lc/pc	Non-weaving	g vehicle inde	ex, I <sub>NW</sub>		
Weavir	ng Segmen	t Speed,	Density,	Level of	Service,	and Cap	oacity		
Weaving s	egment flow rate	, V		7649 veh/h	Weaving inte	ensity factor,	W		
Weaving s	egment capacity	, c <sub>w</sub>		7165 veh/h	Weaving seg	gment speed	, S		mph
Weaving s	egment v/c ratio			1.067	Average wea	aving speed,	S <sub>w</sub>		mph
Weaving s	egment density,	D		pc/mi/ln	Average nor	n-weaving sp	eed, S <sub>NW</sub>		mph
Level of S	ervice, LOS			F	Maximum w	eaving length	n, L <sub>MAX</sub>		5908 f
Notes									
a. Weaving	segments longer t	han the calcula	ited maximum le	ength should l	be treated as is	solated merge	and diverge ar	eas using the	procedures of

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

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	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed	AECOM		Highway/Direction of Travel From/To Jurisdiction	l-95 SB Seg 7-B	et Off & On Ramp
Analysis Time Period	PM		Analysis Year	No-Buila	1 2040
Project Description SW 10t	h Street SIMR				
✓ Oper.(LOS)	)		Des.(N)	Pla	anning Data
Flow Inputs					
Volume, V AADT	5690	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub>	0.95 3	
Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	%RVs, P <sub>R</sub> General Terrain: Grade % Length Up/Down %	0 Level mi	
Calculate Flow Adjustr	nents				
f <sub>p</sub>	1.00		E <sub>R</sub>	1.2	
E <sub>T</sub>	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
Speed Inputs			Calc Speed Adj and FFS	3	
Lane Width Rt-Side Lat Clearance		ft	fue		mph
Number of Lanes, N Total Ramp Density, TRD	3	ramps/mi	f <sub>LC</sub> 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 <sub>p</sub> = (V or DDHV) / (PHF x N S D = v <sub>p</sub> / S LOS	x f <sub>HV</sub> x f <sub>p</sub> ) 2026 62.1 32.6 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 <sub>HV</sub> x f <sub>p</sub> )	pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base free	speed ee-flow speed	E <sub>R</sub> - Exhibits 11-10, 11-12 E <sub>T</sub> - Exhibits 11-10, 11-11, 11- f <sub>p</sub> - Page 11-18 LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2	13 2, 11-3	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-11

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		RAI	MPS AND	RAMP JUN	CTIONS W	ORKSH	EET				
General	Inforr	nation			Site Infor	mation					
Analyst Agency or Co Date Perform Analysis Time	mpany ed e Period	AECO	ОМ	F Ji Ji A	reeway/Dir of Tr unction urisdiction nalysis Year	avel	I-95 S Seg 8 No-Bu	B -Merge from iild 2040	n 10th St		
Project Descr	iption	SW 10th Stree	t 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		Acceleration L	ane Length, L <sub>A</sub>	1470					□ Yes	🗌 On
🗌 No	✓ Off		Deceleration I Freeway Volu	Lane Length L <sub>D</sub> me, V <sub>F</sub>	5690					🗹 No	Off
L <sub>up</sub> =	2210 f	t	Ramp Volume Freeway Free	e, V <sub>R</sub> -Flow Speed, S <sub></sub>	1560 70 0					L <sub>down</sub> =	ft
V <sub>u</sub> =	1500 v	eh/h	Ramp Free-Fl	ow Speed, S <sub>FR</sub>	50.0					V <sub>D</sub> =	veh/h
Convers	ion to	pc/h Und	der Base	Conditions						1	
(pc/h)		V (Veh/hr)	PHF	Terrain	%Truck	%Rv		f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF	x f <sub>HV</sub> x f <sub>p</sub>
Freeway		5690	0.95	Level	3	0	0	).985	1.00	6	079
Ramp		1560	0.92	Level	2	0	0	).990	1.00	1	713
UpStream		1500	0.92	Level	2	0		).990	1.00	1	647
DownStream			Morgo Areas						)iverge Areas		
Estimatio	on of	v <sub>12</sub>	Neige Aleas			Estimation of v <sub>12</sub>					
		$V_{12} = V_{F}$	( P <sub>FM</sub> )					\/ = \	(1 + 1)	\D	
L <sub>EO</sub> =		2533.17	(Equation	13-6 or 13-7)		_		v <sub>12</sub> –	<sup>v</sup> R ' ( <sup>v</sup> F <sup>-</sup> <sup>v</sup> R	パ FD	2)
		0.598	using Equat	ion (Exhibit 13-6	)	EQ -		(	Equation 13-		5) 7\
V <sub>10</sub> =		3636 r	oc/h	( iiiiiii	,	FD T		ı	using Equatio	on (Exhibit 13	-7)
12		2443 r	oc/h (Equati	on 13-14 or 13	_	v <sub>12</sub> =		I	oc/h		
$V_3$ or $V_{av34}$ Is $V_3$ or $V_{av34}$	, > 2,700	17) ) pc/h?  Yes	s 🔽 No			$V_3 \text{ or } V_{av34}$ pc/n (Equation 13-14 or 13-17) Is $V_3$ or $V_{av34}$ > 2,700 pc/h? Yes No					()
Is V <sub>2</sub> or V <sub>2224</sub>	, > 1.5 * <sup>°</sup>					Is $V_3$ or $V_{av}$	<sub>34</sub> > 1.	5 * V <sub>12</sub> /2	Yes No		
lf Yes,V <sub>12a</sub> =	ŧ -	3636 µ	oc/h (Equati 13-19)	on 13-16, 13-		If Yes, $V_{12a}$ = $pc/h$ (Equation 13-16, 13-18, or 13-19)				3-18, or	
Capacity	Che	cks	10 10)			Capacit	v Ch	necks			
		Actual		apacity	LOS F?		<u></u>	Actual	Ca	pacity	LOS F?
						Vr			Exhibit 13-	8	
V <sub>FO</sub>		7792	Exhibit 13-8		Yes	V <sub>FO</sub> = V <sub>F</sub>	- V <sub>R</sub>		Exhibit 13-	8	
						V <sub>R</sub>			Exhibit 13	-	
Flow Ent	tering	Merge In	fluence A	rea	1 10 10 -	Flow Er	<u>iterii</u>	ng Dive	rge Influen	ice Area	1010
		Actual	Max	Desirable	Violation?		+	Actual	Max Des	irable	Violation?
V <sub>R12</sub>		5349	Exhibit 13-8	4600:All	Yes	V <sub>12</sub>			Exhibit 13-8		
Level of	Servi	ce Detern	nination (	if not F)		Level of	f Ser	vice De	terminatio	n (if not	F)
D <sub>R</sub> = 5	5.475 + (	).00734 v <sub>R</sub> + (	).0078 V <sub>12</sub> - 0.	00627 L <sub>A</sub>			D <sub>R</sub> =	4.252 + 0	.0086 V <sub>12</sub> - 0	.009 L <sub>D</sub>	
D <sub>R</sub> = 37.1	2 (pc/mi/ =vbibit 1	/ln) 3 2)				D <sub>R</sub> = (p	oc/mi/ =vhihi	'ln) it 13_2)			
		vination						mincti-			
Speed D	elerm	mauon				Speed L	Jete		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		
M <sub>S</sub> = 0.9	95 (Exib	it 13-11)				⊔ <sub>s</sub> ≓ (E s –		13-12)			
S <sub>R</sub> = 42.3	2 mph (E	Exhibit 13-11)				S <sub>R</sub> - m	ipn (Ex	(13-12)			
S <sub>0</sub> = 62.	6 mph (E	Exhibit 13-11)				S₀= m	iph (Ex	(nibit 13-12)			
S = 47.	0 mph (E	Exhibit 13-13)				S= m	iph (Ex	hibit 13-13)			

	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed	AECOM		Highway/Direction of Travel From/To Jurisdiction	I-95 SB Seg 9-Bo	et 10th & Exit to Exp
Analysis Time Period	PM		Analysis Year	No-Build	1 2040
	n Sireel Simk				unning Data
			Jes.(N)		In Thing Data
Volume, V AADT	7250	veh/h veh/dav	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub>	0.95 3	
Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	%RVs, P <sub>R</sub> General Terrain: Grade % Length Up/Down %	0 Level mi	
Calculate Flow Adjustr	nents				
f <sub>p</sub> F	1.00 1.5		$E_{R}$	1.2 0.985	
-⊺ Speed Inputs	1.5		$HV$ $HV$ $R^{(LR}$ $HV$	0.900	
Speed inputs			Calc Speed Auj allu 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 <sub>∟w</sub> f <sub>LC</sub> TRD Adjustment FFS	70.0	mph mph mph mph
LOS and Performance	Measures		Design (N)		
<u>Operational (LOS)</u> v <sub>p</sub> = (V or DDHV) / (PHF x N ) S D = v <sub>p</sub> / S LOS	x f <sub>HV</sub> x f <sub>p</sub> ) 2582 47.8 54.0 F	pc/h/ln mph pc/mi/ln	$\frac{\text{Design (N)}}{\text{Design LOS}}$ $v_p = (V \text{ or DDHV}) / (PHF x N x)$ $S$ $D = v_p / S$ Required Number of Lanes, N	f <sub>HV</sub> x f <sub>p</sub> )	pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base free our volume	speed ee-flow speed	E <sub>R</sub> - Exhibits 11-10, 11-12 E <sub>T</sub> - Exhibits 11-10, 11-11, 11- f <sub>p</sub> - Page 11-18 LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2	13 2, 11-3	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - 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 Compan	iy AECO	ОМ	Ju	nction		Seg 10	- Diverge t	o Express		
Date Performed			Ju	risdiction		-	-			
Analysis Time Perio	od PM		An	alysis Year		No-Bui	ld 2040			
Project Description	SW 10th Stree	t SIMR								
Inputs		1								
Upstream Adi	Ramp	Freeway Nun	nber of Lanes, N	3					Downstrea	m Adi
	- 1-	Ramp Numbe	er of Lanes, N	1					Ramp	· <b>,</b>
✓ Yes	🗹 On	Acceleration	Lane Length, L							
		Deceleration	l ane l ength l	300						
No	U Off	Erooway Volu		7050					🗹 No	Off
	$= 6000 \text{ ft} \qquad \text{Derry Volume, V}$								1. =	ft
		Ramp volum	e, v <sub>R</sub>	//0					-down	
V = 1	560 veh/h	Freeway Free	e-Flow Speed, S <sub>FF</sub>	70.0					V <sub>D</sub> =	veh/h
°u		Ramp Free-F	low Speed, S <sub>FR</sub>	45.0					D	
Conversion	Conversion to pc/h Under Base Conditions									
(nc/h)	V	PHF	Terrain	%Truck	%Rv		f	f	v = V/PHF	x f x f
(po/ii)	(Veh/hr)		Tontain	7011001	701 (V		·HV	р		· ·HV · · ·p
Freeway	7250	0.95	Level	3	0	0.	985	1.00	774	6
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										
<b>F</b> atimatian	<b>.</b>	werge Areas			Diverge Areas					
Estimation C	<sup>or v</sup> 12				Estimati		<sup>r v</sup> 12			
	V <sub>12</sub> = V <sub>F</sub>	( P <sub>FM</sub> )					V <sub>12</sub> =	• V <sub>R</sub> + (V <sub>F</sub> - V	<sub>R</sub> )P <sub>FD</sub>	
	(Equa	ition 13-6 or	13-7)		L <sub>EO</sub> =		92	262.56 (Equat	ion 13-12 or	13-13)
P =	usina	Equation (	Fxhibit 13-6)				0.	527 usina Fa	uation (Exhib	it 13-7)
V =	nc/h				гл V., =		4/	185 nc/h		
$v_{12}^{-}$	pc/n	Equation 10	44 40 47)		$^{\circ}12$			100 pc/n	otion 12 11	or 10 17)
v <sub>3</sub> or v <sub>av34</sub>	pc/n (	Equation 13	3-14 or 13-17)		v <sub>3</sub> 01 v <sub>av34</sub>	. 0 7	رک ۵۵ م. د/اد Ω	201 pc/n (Equ	ation 13-14	or 13-17)
Is $V_3$ or $V_{av34} > 2,1$	700 pc/h? Ye	s 🗌 No			is v <sub>3</sub> or v <sub>av3</sub>	<sub>34</sub> > 2,1				
Is $V_3$ or $V_{av34} > 1.5$	5 * V <sub>12</sub> /2  Ye	s 🗌 No			Is V <sub>3</sub> or V <sub>av3</sub>	<sub>34</sub> > 1.5	* V <sub>12</sub> /2	🗌 Yes 🗹 No		
lf Yes,V <sub>12a</sub> =	pc/h (	Equation 13	8-16, 13-18, or		If Yes,V <sub>12a</sub> =		50	)46 pc/h (Equ	ation 13-16	13-18,
Conceity Ch	13-19)				Conceit	c Ch	0	r 13-19)		
Capacity Ch	ecks		De		Capacity Checks					
	Actual		Japacity	LUS F?			Actual			LUSF?
					V <sub>F</sub>		//46	Exhibit 13-	8 7200	Yes
V <sub>FO</sub>		Exhibit 13-8			$V_{FO} = V_{F}$	- V <sub>R</sub>	6901	Exhibit 13-	8 7200	No
					V <sub>R</sub>		845	Exhibit 13-1	0 2100	No
Flow Enterin	na Merae In	fluence A	lrea		Flow En	terin	a Dive	rae Influen	ce Area	•
	Actual	Max	Desirable	Violation?	-		Actual	Max Desiral	ble	Violation?
V <sub>P12</sub>		Exhibit 13-8			V <sub>12</sub>	4	485	Exhibit 13-8	4400:All	Yes
l evel of Ser	vice Detern	nination (	(if not F)		l evel of	Ser	vice De	terminatio	n (if not F	;)
$D = 5.475 \pm 0$	0.00734 v + 1	0.0078.\/	0.006271				252 + 0	0086 V = 0		/
$D_{\rm R} = 0.473 \pm 0.$	5.00734 V <sub>R</sub> +	0.0070 v <sub>12</sub>	- 0.00027 L <sub>A</sub>				, .,, .	.0000 v <sub>12</sub> - 0.	DOB LD	
$D_R = (pc/mi/i)$	n)				$D_{\rm R} = 47$	.1 (pc	/mi/in)			
LOS = (Exhibit	t 13-2)				LOS = F	(Exhit	oit 13-2)			
Speed Deter	rmination				Speed D	)eter	minatio	on		
M <sub>s</sub> = (Exibit	13-11)				D <sub>s</sub> = 0.3	374 (E	xhibit 13	-12)		
$S_{n} = mnh (Fv)$	, (hibit 13-11)				S <sub>R</sub> = 59	.5 mph	(Exhibit	13-12)		
	$\frac{1}{10} \frac{1}{10} \frac$				S <sub>0</sub> = 71	1 mnh	(Exhibit	, 13-12)		
S = mph(E)	which $13-11$				S - 60		(Evhibit	13 12)		
					<u> </u>	o mpn		10-10)	<u></u>	0/0040
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	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst			Highway/Direction of Travel	I-95 SB	Bat Off Evp Off
Agency or Company	AECOM		From/To	Samples	s con Exp On
Date Performed Analysis Time Period	PM		Jurisdiction Analysis Year	No-Build	1 2040
Project Description SW 10	th Street SIMR				
✓ Oper.(LOS	)		Des.(N)	Pla	anning Data
Flow Inputs					
Volume, V	6480	veh/h	Peak-Hour Factor, PHF	0.95	
AADT		veh/day	%Trucks and Buses, P <sub>T</sub>	3	
Peak-Hr Prop. of AADT, K			%RVs, P <sub>R</sub>	0	
Peak-Hr Direction Prop, D			General Terrain:	Level	
DDHV = AADT x K x D		veh/h	Grade % Length	ті	
Calculate Flow Adjust	ments				
f <sub>p</sub>	1.00		E <sub>R</sub>	1.2	
Ε <sub>T</sub>	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 <sub>LW</sub>		mph
Number of Lanes, N	3		f <sub>LC</sub>		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 <sub>p</sub> = (V or DDHV) / (PHF x N	x f <sub>HV</sub> x f <sub>p</sub> ) 2308	pc/h/ln	$v_{x} = (V \text{ or } DDHV) / (PHF x N x)$	f.,, x f.)	pc/h/ln
S	55.8	mph	s p	ну р	mph
$D = v_p / S$	41.4	pc/mi/ln	D = v / S		nc/mi/ln
LOS	E		Required Number of Lanes. N		pormini
Glossary			Factor Location		
N. Number of lance	C Croad				
			E <sub>R</sub> - Exhibits 11-10, 11-12		f <sub>LW</sub> - Exhibit 11-8
v - Houriy volume		anaad	E <sub>T</sub> - Exhibits 11-10, 11-11, 11-	-13	f <sub>LC</sub> - Exhibit 11-9
v <sub>p</sub> - Flow rate	FFS - Free-flow	speed	f <sub>n</sub> - Page 11-18		 TRD - Page 11-11
LOS - Level of service	BFFS - Base fre	e-flow speed	LOS, S, FFS, v <sub>n</sub> - Exhibits 11-	2, 11-3	5
טוועט - Urectional design h	our volume		٣		

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		RAMP	S AND RAM	P JUNCTI	ONS WO	RKS	HEET			
General Infor	rmation			Site Infor	mation					
Analyst			Fre	eeway/Dir of Tra	avel	I-95 SE	}			
Agency or Company	AECO	DM	Ju	nction		Seg 12	- Diverge t	o Sample Rd		
Date Performed			Ju	risdiction		-	-			
Analysis Time Perio	d PM		An	alysis Year		No-Bui	ld 2040			
Project Description	SW 10th Street	t SIMR								
Inputs		1								
Upstream Adj F	Ramp	Freeway Num	ber of Lanes, N	3					Downstrea	ım Adj
		Ramp Numbe	er of Lanes, N	1					Ramp	,
I ✓ Yes	On	Acceleration I	ane Length, L							$\Box$ On
		Deceleration	ane Length L	250						
NO NO	∠ Off	Erooway Volu		6490					🗹 No	Off
	000 <del>ff</del>		inite, v <sub>F</sub>	0400					L. =	ft
	$L_{up} = 2000 \pi$ Ramp Volume, V <sub>R</sub>								-down	
V = 77	70 veh/h	Freeway Free	e-Flow Speed, S <sub>FF</sub>	70.0					V <sub>D</sub> =	veh/h
-u ,,		Ramp Free-F	low Speed, S <sub>FR</sub>	45.0						
Conversion t	Conversion to pc/h Under Base Conditions									
(nc/h)	V	PHF	Terrain	%Truck	%Rv		f	f	v = V/PHF	x fx f
(poin)	(Veh/hr)		Torrain	7011000	/01(1		·HV	р		HV P
Freeway	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
UpStream	770	0.92	Level	2	0	0.	990	1.00	84	15
DownStream	L									
	<u> </u>	Merge Areas			Diverge Areas					
Estimation of	r v <sub>12</sub>				Estimat	ion o	<sup>r v</sup> 12			
	V <sub>12</sub> = V <sub>F</sub>	(P <sub>FM</sub> )					V <sub>12</sub> =	• V <sub>R</sub> + (V <sub>F</sub> - V	′ <sub>R</sub> )P <sub>FD</sub>	
L <sub>EO</sub> =	(Equa	tion 13-6 or	13-7)		L <sub>EO</sub> =		(	Equation 13-	12 or 13-13	)
	usina	Equation (	Exhibit 13-6)				0.	521 usina Ea	uation (Exhi	bit 13-7)
V <sub>40</sub> =	nc/h		,		V=		42	94 nc/h		
V or V	po/h (l	Equation 13	14  or  13 17		$V_{\rm or} V$			20 po/h (Equ	untion 12 1/	or 12 17)
$v_3 v_{av34}$	pc/ii (i ארש באלים 00		-14 01 13-17)		$v_3 \circ v_{av34}$	> 0 7	∠ر ⊐ 20/pa			FOI 13-17)
$15 v_3 01 v_{av34} > 2,70$						34 ~ 2,1	* ) ( /0 E			
IS $V_3$ or $V_{av34} > 1.5$	<sup>™</sup> V <sub>12</sub> /2 ∐ Yes	S ∐ NO Faulations 40	10 10 10		IS V <sub>3</sub> OF V <sub>av</sub>	<sub>34</sub> > 1.5	" V <sub>12</sub> /2	_Yes ⊻No	- 40 40 40	10
If Yes,V <sub>12a</sub> =	pc/n (i 13-19)	Equation 13	-16, 13-18, 01		If Yes,V <sub>12a</sub> =	=	p 10	ic/n (Equation	1 13-16, 13-	18, or 13-
Canacity Che	ecks				Canacit	v Ch	ecks	5]		
	Actual		anacity	LOS E2		<u>, en</u>	Actual	C	anacity	LOS E2
	710100		Japaony	20011	V_		6023	Evhibit 13	8 7200	No
Ň		E 1 11 11 40 0				<u></u>	5 4 9 5		0 7200	
v <sub>FO</sub>		EXNIDIT 13-8			V <sub>FO</sub> – V <sub>F</sub>	- v <sub>R</sub>	5485	Exhibit 13-	8 7200	NO
					V <sub>R</sub>		1438	Exhibit 13-	10 2100	No
Flow Entering	g Merge In	fluence A	lrea		Flow En	terin	g Dive	rge Influer	nce Area	
	Actual	Max	Desirable	Violation?		/	Actual	Max Desira	ble	Violation?
V <sub>R12</sub>		Exhibit 13-8			V <sub>12</sub>	4	1294	Exhibit 13-8	4400:All	No
Level of Serv	vice Detern	nination (	ïf not F)		Level of	f Serv	/ice De	terminatio	n (if not l	F)
D <sub>P</sub> = 5.475 + 0	.00734 v <sub>P</sub> + (	).0078 V <sub>12</sub> ·	- 0.00627 L <sub>A</sub>			D <sub>P</sub> = 4	.252 + 0	.0086 V <sub>12</sub> - 0	.009 L <sub>D</sub>	•
$D_{\rm p} = (\rm pc/mi/lr$	n)	12	~		$D_{-} = 40$	) 8 (nc.	/mi/ln)	12	D	
R (Form)	·/ 12 2)					/Eve:	11 4 2 - O			
	13-2)				LUG - E		JIL 13-2)			
Speed Deteri	mination				Speea L	Jeter	minatic	on		
M <sub>S</sub> = (Exibit 1	3-11)				D <sub>s</sub> = 0.	427 (E	xhibit 13-	-12)		
S <sub>R</sub> = mph (Ext	nibit 13-11)				S <sub>R</sub> = 58	3.0 mph	(Exhibit	13-12)		
$S_0 = mph (Ext)$	nibit 13-11)				S <sub>0</sub> = 71	1.3 mph	(Exhibit	13-12)		
S = mph (Ext	, nibit 13-13)				S = 62	2.1 mph	(Exhibit	13-13)		
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	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed	AECOM		Highway/Direction of Travel From/To Jurisdiction	l-95 SB Seg 13-l	Bet Off & On Ramps
Analysis Time Period	PM		Analysis Year	No-Buila	1 2040
Project Description SW 10	th Street SIMR				
✓ Oper.(LOS	)		Des.(N)	Pla	inning Data
Flow Inputs					
Volume, V AADT	5170	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P <sub>T</sub>	0.95 3	
Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	%RVs, P <sub>R</sub> General Terrain: Grade % Length Up/Down %	0 Level mi	
Calculate Flow Adjust	ments				
f <sub>p</sub>	1.00		E <sub>R</sub>	1.2	
	1.5		$T_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	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 <sub>∟w</sub> f <sub>LC</sub> TRD Adjustment FFS	70.0	mph mph mph mph
LOS and Performance	Measures		Design (N)		
<u>Operational (LOS)</u> v <sub>p</sub> = (V or DDHV) / (PHF x N S D = v <sub>p</sub> / S LOS	x f <sub>HV</sub> x f <sub>p</sub> ) 1841 65.2 28.2 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 <sub>HV</sub> x f <sub>p</sub> )	pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v <sub>p</sub> - Flow rate LOS - Level of service DDHV - Directional design h	S - Speed D - Density FFS - Free-flow BFFS - Base fre our volume	speed ee-flow speed	E <sub>R</sub> - Exhibits 11-10, 11-12 E <sub>T</sub> - Exhibits 11-10, 11-11, 11- f <sub>p</sub> - Page 11-18 LOS, S, FFS, v <sub>p</sub> - Exhibits 11-2	13 2, 11-3	f <sub>LW</sub> - Exhibit 11-8 f <sub>LC</sub> - Exhibit 11-9 TRD - Page 11-11

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		F	REEWA	Y WEAV	ING WOF	RKSHEE	Т		
Gener	al Informatio	on			Site Info	ormation			
Analyst Agency/C Date Perf Analysis T	company formed Time Period	AECON PM	1		Freeway/Dir Weaving Sey Analysis Yea	of Travel gment Locati ar	I-95 S ion Seg 1 No-B	SB I4- Bet Sampl uild 2040	le & Copa
Project De	escription SW 10th	n Street SIMR							
Inputs	;								
Weaving Weaving Weaving Freeway f	configuration number of lanes, N segment length, L <sub>s</sub> free-flow speed, FF	I FS		One-Sided 4 1650ft 70 mph	Segment typ Freeway mir Freeway ma Terrain type	e nimum speed ximum capad	I, S <sub>MIN</sub> city, C <sub>IFL</sub>		Fre
Conve	ersions to po	/h Unde	r Base Co	ondition	s		-	-	
	V (veh/h)	PHF	Truck (%)	RV (%)	Ε <sub>Τ</sub>	E <sub>R</sub>	f <sub>HV</sub>	fp	v (pc
V <sub>FF</sub>	4430	0.95	3	0	1.5	1.2	0.985	1.00	4733
V <sub>RF</sub>	1580	0.92	2	0	1.5	1.2	0.990	1.00	173
V <sub>FR</sub>	740	0.92	2	0	1.5	1.2	0.990	1.00	812
V <sub>RR</sub>	0	0.95	0	0	1.5	1.2	1.000	1.00	0
V <sub>NW</sub>	4733							V =	728
V <sub>W</sub>	2547								
VR	0.350								
Config	guration Cha	racterist	ics		r				
Minimum	maneuver lanes, N	N <sub>WL</sub>		2 lc	Minimum we	eaving lane c	hanges, LC <sub>MIN</sub>	I	
Interchan	ige density, ID			0.7 int/mi	Weaving lar	ne changes, l	LCw		
Minimum	RF lane changes,	LC <sub>RF</sub>		1 lc/pc	Non-weavin	g lane chang	jes, LC <sub>NW</sub>		
Minimum	FR lane changes,	$LC_{FR}$		1 lc/pc	Total lane cl	hanges, LC <sub>Al</sub>	L		
Minimum	RR lane changes,	LC <sub>RR</sub>		lc/pc	Non-weavin	g vehicle ind	ex, I <sub>NW</sub>		
Weavi	ng Segment	Speed,	Density, l	Level of	Service,	and Ca	pacity		
Weaving Weaving	segment flow rate, segment capacity,	v c <sub>w</sub>		7185 veh/h 6758 veh/h	Weaving inte Weaving se	ensity factor, gment speed	W I, S		
Weaving	segment v/c ratio	~		1.063	Average we	aving speed,			
vveaving	Segment density, L	J		pc/mi/in ⊑	Average nor		heeu, o <sub>NW</sub>		~
				Γ	waximum w	eaving lengt	II, L <sub>MAX</sub>		6
NOTES a. Weaving	g segments longer th	nan the calcula	ted maximum le	ength should l	be treated as is	solated merge	and diverge ar	eas using the	procedure
Chapter 13 b. For volu	<ol> <li>"Freeway Merge a imes that exceed the</li> </ol>	nd Diverge Se weaving segr	gments". nent capacity, t	he level of ser	rvice is "F".		-		
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