		F	REEWAY	WEAV	ING WOF	RKSHEE	Г			
Genera	Informatio	on		Site Information						
Analyst Agency/Con Date Perforr 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 2020 Build 2				
Project Dese	cription SW 10th	n Street SIMR								
Inputs										
Weaving configurationOne-SidedWeaving number of lanes, N4Weaving segment length, Ls2380ftFreeway free-flow speed, FFS70 mph					Segment type Fre Freeway minimum speed, S _{MIN} Freeway maximum capacity, C _{IFL} Terrain type					
Convers	sions to po	/h Unde	r Base Co	ondition	s		1	Ĩ	-	
	V (veh/h)	PHF	Truck (%)	RV (%)	Ε _Τ	E _R	f _{HV}	fp	v (pc/h)	
V _{FF}	4565	0.95	3	0	1.5	1.2	0.985	1.00	4877	
V _{RF}	355	0.92	2	0	1.5	1.2	0.990	1.00	390	
V _{FR}	800	0.92	2	0	1.5	1.2	0.990	1.00	878	
V _{RR}	0	0.95	0	0	1.5	1.2	1.000	1.00	0	
V _{NW}	4877		•	•	-		-	V =	6145	
V _W	1268							-		
VR	0.206									
Configu	ration Cha	racterist	ics		•					
Minimum m	aneuver lanes, N	N _{WL}		2 lc	Minimum we	aving lane cl	nanges, LC _{MIN}	I	1268 lc/h	
Interchange	density, ID			0.7 int/mi	Weaving lane changes, LC _w 1703 lc					
Minimum R	F lane changes,	LC _{RF}		1 lc/pc	Non-weaving lane changes, LC _{NW} 1					
Minimum Fl	R lane changes,	LC _{FR}		1 lc/pc	Total lane ch	nanges, LC _{ALI}	L		3227 lc/h	
Minimum R	R lane changes,	LC _{RR}		lc/pc	Non-weaving	g vehicle inde	ex, I _{NW}		813	
Weavin	g Segment	Speed,	Density, I	_evel of	Service,	and Cap	oacity			
Weaving se Weaving se	gment flow rate, gment capacity,	v c _w		6061 veh/h 8788 veh/h	Weaving inte Weaving seg	ensity factor, gment speed	W , S		0.287 54.3 mph	
Weaving se	gment v/c ratio			0.690	Average wea	aving speed,	Sw		57.7 mph	
Weaving se	gment density, [)	28	3.3 pc/mi/ln	Average nor	n-weaving spo	eed, S _{NW}		53.5 mph	
Level of Sei	VICE, LOS			D	Maximum weaving length, L _{MAX} 4601 ft					
Notes 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		
General Information			Site Information		
Analyst			Highway/Direction of Travel	I-95 NB Sea 2-Bi	et Off & On from
Agency or Company	AECOM		From/To	Sample	
Date Performed Analysis Time Period	AM		Jurisdiction Analysis Year	2020 Bu	ild 2
Project Description SW 10	th Street SIMR				
✓ Oper.(LOS	5)		Des.(N)	Pla	nning Data
Flow Inputs					
Volume, V AADT	4920	veh/h veh/dav	Peak-Hour Factor, PHF %Trucks and Buses, P-	0.95 .3	
Peak-Hr Prop. of AADT K		Voli/day	%RVs P_	0	
Peak-Hr Direction Prop, D			General Terrain:	Level	
DDHV = AADT x K x D		veh/h	Grade % Length	mi	
			Up/Down %		
Calculate Flow Adjust	ments				
f _p	1.00		E _R	1.2	
Ε _T	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
Speed Inputs			Calc Speed Adj and FF	S	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f _{LW}		mph
Number of Lanes, N	3		f _{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS	3	mph			·
LOS and Performance	Measures		Design (N)		
Operational (LOS)			Design (N)		
	1 x f x f \ 4750	n e /h /lin	Design LOS		
$v_p = (v \text{ or } D D \Pi v) / (P \Pi F X N)$	$(X_{HV} X_p) 7752$	pc/n/in	v _p = (V or DDHV) / (PHF x N x	(f _{HV} x f _p)	pc/h/ln
S D=v / C	66.5	mpn	S		mph
$D = V_p / S$	26.4	pc/mi/ln	$D = v_p / S$		pc/mi/ln
LUS	D		Required Number of Lanes, N		
Glossary			Factor Location		
N - Number of lanes	S - Speed				
V - Hourly volume	D - Density		E_{R} - Exhibits 11-10, 11-12	10	T _{LW} - Exhibit 11-8
v _p - Flow rate	FFS - Free-flow	speed	E_{T} - Exhibits 11-10, 11-11, 11	-13	T _{LC} - Exhibit 11-9
LOS - Level of service	BFFS - Base fre	e-flow speed	r _p - Page 11-18		I'RD - Page 11-11
DDHV - Directional design h	our volume		LOS, S, FFS, v _p - Exhibits 11-	2, 11-3	

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apacity Check (see Exhibits 25-3 and 25-7):	Maximum	Actual	V/c	LOS F?
y downstream of ramp (assume 70 mph free-flow speed) =	9,600	6,560	0.68	No
<i>y</i> upstream of ramp (assume 70 mph free-flow speed) =	7,200	5,257	0.73	No
pacity on On-Ramp (assume 45 mph free-flow speed) =	2,100	1,297	0.62	No
	pacity Check (see Exhibits 25-3 and 25-7): y downstream of ramp (assume 70 mph free-flow speed) = y upstream of ramp (assume 70 mph free-flow speed) = pacity on On-Ramp (assume 45 mph free-flow speed) =	pacity Check (see Exhibits 25-3 and 25-7):Maximumy downstream of ramp (assume 70 mph free-flow speed) =9,600y upstream of ramp (assume 70 mph free-flow speed) =7,200pacity on On-Ramp (assume 45 mph free-flow speed) =2,100	pacity Check (see Exhibits 25-3 and 25-7):MaximumActualy downstream of ramp (assume 70 mph free-flow speed) =9,6006,560y upstream of ramp (assume 70 mph free-flow speed) =7,2005,257pacity on On-Ramp (assume 45 mph free-flow speed) =2,1001,297	pacity Check (see Exhibits 25-3 and 25-7):MaximumActualV/cy downstream of ramp (assume 70 mph free-flow speed) =9,6006,5600.68y upstream of ramp (assume 70 mph free-flow speed) =7,2005,2570.73pacity on On-Ramp (assume 45 mph free-flow speed) =2,1001,2970.62

RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Info	rmation			Site Infor	mation					
Analyst			Fr	eeway/Dir of Tr	ravel I-95 NB					
Agency or Compan	y AEC	ОМ	Ju	inction		Seg 4	-On from Ex	(p		
Date Performed	-		Ju	irisdiction		Ū				
Analysis Time Peri	od AM		Ar	nalysis Year		2020	Build 2			
Project Description	SW 10th Stree	t SIMR								
Inputs										
LInstream Adi Ram	n	Freeway Num	ber of Lanes, N	4					Downstre	am Adi
	٢	Ramp Numbe	r of Lanes, N	1					Ramp	
Yes C	Dn	Acceleration I	ane Length L	1500						
		Deceloration	ano Longth L	1000					I Yes	□ On
🗹 No 🛛 🗆 C	Off								🗌 No	✓ Off
		Freeway Volu	me, V _F	6140					. _	2050 G
$L_{up} = ft$		Ramp Volume	e, V _R	690					└down [—]	2950 11
	//_	Freeway Free	-Flow Speed, S _{FF}	70.0					V_ =	140 veb/b
v _u – ven/	'n	Ramp Free-Fl	ow Speed, S _{FR}	50.0					*D	140 Ven/11
Conversion	to pc/h Un	der Base	Conditions						I	
(pc/h)	V	PHF	Terrain	%Truck	%Rv		f _{LN/}	f	v = V/PHF	x f _{uv} x f _n
	(Veh/hr)	0.05						р 1 00		ΠV μ
Freeway	6140	0.95	Level	3	0).985	1.00	6	560
Ramp	690	0.92	Level	2	0	().990	1.00	· · · · · ·	'57
OpStream Down Stream	140	0.00	1		0		000	4.00	<u> </u>	F A
DownStream	140	0.92 Marga Araga	Level	Ζ	0		J.990			104
Estimation	of v	werge Areas			Estimation of v					
	12				LStimat		12			
	$V_{12} = V_{F}$	(P _{FM})					$V_{12} = 1$	V _P + (V _F - V _P)P _{ED}	
L _{EQ} =	(Equ	ation 13-6 o	r 13-7)		L=0 =		12	(Equation 13-	12 or 13-1	3)
P _{FM} =	0.123	using Equat	tion (Exhibit 13-6)		EQ P =			using Equatio	n (Exhibit 1?	-7)
V ₁₂ =	808 p	c/h			· FD V -			no/h		, , ,
	2876	pc/h (Equati	on 13-14 or 13-		v ₁₂ –			pc/m	0.4.4.40.4	-
v 3 01 v av34	17)				v ₃ 01 v _{av34}		700 "0 "	pc/n (Equation 1	3-14 Of 13-1	()
Is V_3 or $V_{av34} > 2,7$	700 pc/h? 🗹 Ye	s 🗌 No			is v ₃ or v _{av}	₃₄ > 2,	/00 pc/n?	∐Yes ∐No		
Is V_3 or $V_{av34} > 1.5$	5*V ₁₂ /2	s 🗌 No			Is V ₃ or V _{av}	₃₄ > 1.	5*V ₁₂ /2	Yes No		
If Yes V., =	2624	pc/h (Equati	on 13-16, 13-		If Yes,V _{12a} =	=	1	pc/h (Equation	∩ 13-16, 13	3-18, or
11 1 00, 1 12a	18, or	13-19)					1.	3-19)		
Capacity Ch	ecks			v	Capacit	y Ch	iecks			
	Actual	0	Capacity	LOS F?			Actual	Car	oacity	LOS F?
					V _F			Exhibit 13-8	3	
Vro	7317	Exhibit 13-8		No	$V_{FO} = V_{F}$	- V _R		Exhibit 13-8	8	
FU					V			Exhibit 13	-	
					[™] R			10		
Flow Enterir	ng Merge In	fluence A	lrea		Flow En	teri	ng Dive	rge Influen	ce Area	
	Actual	Max	Desirable	Violation?		_	Actual	Max Desi	rable	Violation?
V _{R12}	3695	Exhibit 13-8	4600:All	No	V ₁₂			Exhibit 13-8		
Level of Ser	vice Detern	nination (if not F)		Level of	f Ser	vice De	terminatio	<u>n (if not</u>	F)
D _R = 5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A						D _R =	4.252 + 0	.0086 V ₁₂ - 0	.009 L _D	
D _R = 26.2 (pc/	/mi/ln)				D _R = (p	oc/mi/	′ln)			
LOS = C (Exhib	it 13-2)				LOS = (E	Exhibi	it 13-2)			
Speed Deter	mination				Speed L	Dete	rminatio	on		
M ₀ = 0.328 /⊑	vihit 13-11)				D,= (E	xhibit	13-12)	· -		
S - 60.0 - 1	$(\Box_{V} \cup \Box_{V} \cup U} \cup \Box_{V} \cup U} \cup \Box_{V} \cup \Box_{V} \cup \Box_{V} \cup U} \cup \Box_{V} \cup \Box_{V} \cup \Box_{V} \cup U} \cup \Box_{V} \cup \Box_{V} \cup U} \cup U \cup$				S_= m	nh (⊑v	(hibit 13-12)			
9 _R - 60.8 mpr	i (Exnidit 13-11)				S =	P'' (∟^ nh (⊏	(hibit 12, 10)			
5 ₀ = 65.7 mpł	n (Exhibit 13-11)				C₀− m	hu (⊏x	(1) (1) (1) (1) (1) (1) (1) (1) (1) (1)			
S = 63.0 mpł	n (Exhibit 13-13)				S= m	ph (Ex	(hibit 13-13)			

		RAMP	S AND RAM	P JUNCTI	ONS WO	RKS	HEET			
General Infor	rmation			Site Infor	mation					
Analyst			Fre	eeway/Dir of Tr	avel	I-95 NE	3			
Agency or Company	AECO	MC	Ju	nction		Seg 5-	Off to Exp f	rom GPL		
Date Performed			Ju	risdiction		-				
Analysis Time Perio	d AM		An	alysis Year		2020 B	uild 2			
Project Description	SW 10th Stree	t SIMR								
Inputs									-	
Upstream Adj F	Ramp	Freeway Nun	nber of Lanes, N	4					Downstrea	am Adj
		Ramp Numbe	er of Lanes, N	1					Ramp	,
Yes 🖸	✓ On	Acceleration	Lane Length, L							
		Deceleration	lane Length L_	200						
									🗹 No	Off
	NEO #	Fieeway voit	ine, v _F	0030					I. =	ft
L ^{up} 28	100 IL	Ramp Volum	e, V _R	140					down	
V = 60	0 veh/h	Freeway Free	e-Flow Speed, S _{FF}	70.0					V _D =	veh/h
	o ven/n	Ramp Free-F	low Speed, S _{FR}	45.0						
Conversion t	o pc/h Und	der Base	Conditions							
(no/h)	V	DUE	Torrain	% Truck	0/ Dv		f	f		vfvf
(рслі)	(Veh/hr)	ГШ	Terrain	/011UCK	/0INV		'HV	'p	v – v/i i ii	^ ' HV ^ ' p
Freeway	6830	0.95	Level	3	0	0.	985	1.00	72	97
Ramp	140	0.92	Level	2	0	0.	990	1.00	1:	54
UpStream	690	0.92	Level	2	0	0.	990	1.00	75	57
DownStream										
	_	Merge Areas				_		iverge Areas		
Estimation of	f v ₁₂				Estimat	ion o	of v ₁₂			
	$V_{12} = V_{E}$	(P _{EM})					V ₁₂ =	V _P + (V _F -)		
L _{FO} =	(Equa	tion 13-6 or	13-7)		Leo =		12	Equation 13	-12 or 13-13)
-EQ P =		Equation (Evhibit 13_6		-EQ P =		0.	136 Using E	nuation (Evhi	/ hit 13 7)
'FM	using				'FD		0.0	+50 using L		bit 13-7)
v ₁₂ -	pc/n				v ₁₂ -		32	68 pc/n		
v ₃ or v _{av34}	pc/h (Equation 13	3-14 or 13-17)		v ₃ or v _{av34}		20	14 pc/h (Eq	uation 13-14	l or 13-17)
Is V_3 or $V_{av34} > 2,70$	00 pc/h? 🗌 Ye	s 🗌 No			Is V ₃ or V _{av}	₃₄ > 2,7	'00 pc/h?	Yes 🗹 No)	
Is V_3 or $V_{av34} > 1.5$	* V ₁₂ /2 Yes	s 🗌 No			Is V ₃ or V _{av}	₃₄ > 1.5	•*V ₁₂ /2 [Yes 🗹 No)	
If Yes,V ₁₂₂ =	pc/h (Equation 13	8-16, 13-18, or		If Yes,V ₁₂₀ =	=	р	c/h (Equatio	n 13-16, 13-	18, or 13-
	13-19)				⁷ 12a	- 01	19	9)		
Capacity Che	ecks	1			Capacity Checks					
	Actual	(Capacity	LOS F?			Actual	(Capacity	LOS F?
					V _F		7297	Exhibit 13	-8 9600	No
V _{FO}		Exhibit 13-8			$V_{FO} = V_{F}$	- V _R	7143	Exhibit 13	-8 9600	No
					V _R		154	Exhibit 13-	10 2100	No
Flow Enterin	a Merae In	fluence /	Irea	I		nterin	a Dive	rae Influe	nce Area	
	Actual	Max	Desirable	Violation?			Actual	Max Desira	able	Violation?
V=	, lotadi	Exhibit 13-8	Doolinabio	violation.	V.		3268	Evhibit 13-8	4400·AII	No
	l vice Detern	ninotion	(if not E)					torminoti	n /if not	
Level of Serv	nce Detern				Leveror	Ser				_)
$D_{R} = 5.475 + 0$	D _R = 5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A					$D_R = 2$	1.252 + 0	.0086 V ₁₂ - (0.009 L _D	
D _R = (pc/mi/lr	_R = (pc/mi/ln)						/mi/ln)			
LOS = (Exhibit	13-2)				LOS = D	(Exhil	bit 13-2)			
Speed Deterr	mination				Speed L	Deter	minatic	n		
Ma = (Evibit 1	- (Evibit 12 11)					312 (F	xhibit 13-	12)		
	\sim 11/				S_= 6'	, 13 mnh	(Exhibit	, 13-12)		
C_R - mpn (Exr	IIDIL 13-11)				S_R^- 61.3 mph (Exhibit 13-12)					
$S_0 = mph(Exh$	13-11)				0^{-} 12	∠.o mpn		13-12)		
S = mpn (Exr	13-13) iti 13-13				5 = 67	(.2 mph	(Exhibit	13-13)		
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	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	AECOM		Highway/Direction of Travel From/To Jurisdiction	I-95 NB Seg 6-So 2020 Bu	outh of Off to 10th
Project Description SW 10t	h Street SIMR			2020 Du	
✓ Oper.(LOS))		Des.(N)	Pla	nning Data
Flow Inputs					<u> </u>
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D	6690	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade % Length	0.95 3 0 Level mi	
		ven/n	Up/Down %	1111	
Calculate Flow Adjustr	nents				
f _p	1.00		E _R	1.2	
Ε _T	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
Speed Inputs			Calc Speed Adj and FFS	6	
Lane Width Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured) Base free-flow Speed, BFFS	4 70.0	ft ft ramps/mi mph mph	f _{⊥w} f _{LC} TRD Adjustment FFS	70.0	mph mph mph mph
LOS and Performance	Measures		Design (N)		
<u>Operational (LOS)</u> v _p = (V or DDHV) / (PHF x N S D = v _p / S LOS	x f _{HV} x f _p) 1787 66.0 27.1 D	pc/h/ln mph pc/mi/ln	Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF x N x)$ S D = v_p / S Required Number of Lanes, N	f _{HV} x f _p)	pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base free our volume	speed ee-flow speed	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2	13 2, 11-3	f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

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	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed	AECOM		Highway/Direction of Travel From/To Jurisdiction	I-95 NB Seg 8-B	et Off & Off Ramps
Analysis Time Period			Analysis rear	2020 Bu	
Oper (LOS)			Des (N)	Pla	nning Data
Flow Inputs	, 				innig Data
Volume, V AADT	5670	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T	0.95 3	
Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	%RVs, P _R General Terrain: Grade % Length Up/Down %	0 Level mi	
Calculate Flow Adjustr	nents				
f _ρ Ε _Τ	1.00 1.5		E _R f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	1.2 0.985	
Speed Inputs			Calc Speed Adj and FFS	6	
Lane Width Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured) Base free-flow Speed, BFFS	3 70.0	ft ft ramps/mi mph mph	f _{⊥w} f _{LC} TRD Adjustment FFS	70.0	mph mph mph mph
LOS and Performance	Measures		Design (N)		
<u>Operational (LOS)</u> v _p = (V or DDHV) / (PHF x N S D = v _p / S LOS	x f _{HV} x f _p)2019 62.2 32.4 D	pc/h/ln mph pc/mi/ln	Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF x N x)$ S D = v_p / S Required Number of Lanes, N	f _{HV} x f _p)	pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base free our volume	speed ee-flow speed	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2	13 2, 11-3	f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

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		RAMP	S AND RAM	P JUNCTI	ONS WO	RKS	HEET			
General Infor	rmation			Site Infor	mation					
Analyst			Fr	eeway/Dir of Tr	avel	I-95 NE	}			
Agency or Company	AEC	OM	Ju	nction		Seg 9-0	Off to Hillsb	oro EB&WB		
Date Performed	J 0.14		Ju	risdiction		0000 0				
Project Description	SW/ 10th Stree		AI	lalysis real		2020 B				
Inputs										
		Freeway Num	her of Lanes N	3						
Upstream Adj R	lamp	Ramp Numbe	ar of Lanes N	1					Downstrea	am Adj
Yes	On		and Longth	I						
				000					Ves 🗹	🖌 On
I No □	Off			200					🗌 No	Off
	4	Freeway Volu	ime, v _F	5670					. =	2100 ft
	L	Ramp Volume	e, V _R	1250					⁻down	2100 11
V = v	eh/h	Freeway Free	e-Flow Speed, S _{FF}	70.0					V _D =	1060 veh/h
		Ramp Free-F	low Speed, S _{FR}	45.0						
Conversion t	o pc/h Un	der Base	Conditions							
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv		f _{HV}	f _p	v = V/PHF	x f _{HV} x f _p
Freeway	5670	0.95	Level	3	0	0.	985	1.00	60	58
Ramp	1250	0.92	Level	2	0	0.	990	1.00	13	72
UpStream										
DownStream	1060	0.92	Level	2	0	0.	990	1.00	11	64
F ationation of	f	Merge Areas			F ation of		<u> </u>	viverge Areas		
Estimation of	^{r v} 12				Estimat		^{r v} 12			
	V ₁₂ = V _F	(P _{FM})					V ₁₂ =	V _R + (V _F - V	′ _R)P _{FD}	
L _{EQ} =	(Equa	ation 13-6 or	13-7)		L _{EQ} =		(Equation 13-	12 or 13-13)
P _{FM} =	using	Equation (Exhibit 13-6)		P _{FD} =		0.	545 using Ec	uation (Exhi	bit 13-7)
V ₁₂ =	pc/h				V ₁₂ =		39	28 pc/h		
V ₃ or V _{av34}	pc/h (Equation 13	-14 or 13-17)		$V_3^{}$ or $V_{av34}^{}$		21	30 pc/h (Equ	uation 13-14	1 or 13-17)
Is V_3 or $V_{av34} > 2,70$)0 pc/h? 🗌 Ye	s 🗌 No			Is V ₃ or V _{av}	₃₄ > 2,7	00 pc/h? [Yes 🗹 No		
Is V_3 or $V_{av34} > 1.5$	*V ₁₂ /2 □Ye	s 🗌 No			Is V ₃ or V _{av}	₃₄ > 1.5	* V ₁₂ /2	Yes 🗹 No		
If Yes,V _{12a} =	pc/h (13 10)	Equation 13	-16, 13-18, or		If Yes,V _{12a} =	=	p	c/h (Equatio	n 13-16, 13-	-18, or 13-
Capacity Che	rks)			Canacit	v Ch	ecks)		
	Actual		Capacity	LOS F?		<u>, en</u>	Actual	С	apacity	LOS F?
					V		6058	Exhibit 13-	8 7200	No
Vro		Exhibit 13-8			$V_{ro} = V_r$	- V_	4686	Exhibit 13	8 7200	No
- FO					V	· · R	1270	Exhibit 13	10 2100	No
Elever Enterin		<u></u>					1372		10 2100	INU
Flow Entering	g werge m	Max	Nrea Dosirablo	Violation?	FIOW En	iterin	g Divel	Max Dosira	nce Area	Violation?
V	Actual	Evhibit 13.8	Desilable	VIOIALION	V		2028	Evhibit 13.8		No
	l vico Dotorr	nination ((if not E)			<u> </u>		torminatic	<i>h</i> (<i>if not</i>	
$D = 5.475 \pm 0$			0.00627.1		Leveror		252 + 0)
$D_R = 0.470 + 0.1$	$D_R = 5.473 + 0.00734 V_R + 0.0078 V_{12} - 0.00027 L_A$					$D_R = 7$	/mi/lm)	12 - 0	.003 L _D	
P _R – (pc/mi/m	l) 40.0\				$D_{\rm R} = 30$	o.z (pc/	/mi/in)			
	13-2)				LUS = E		oit 13-2)			
Speed Deterr	nination				Speed L	Jeter	minatio	on 		
M _S = (Exibit 1	3-11)				$D_{s} = 0.0$	421 (E	xhibit 13-	12)		
S _R = mph (Exh	nibit 13-11)				$S_R = 58$	3.2 mph	(Exhibit	13-12)		
S ₀ = mph (Exh	nibit 13-11)				$S_0 = 72$	2.4 mph	(Exhibit	13-12)		
S = mph (Exh	nibit 13-13)				S = 62	2.5 mph	(Exhibit	13-13)		
yright © 2016 Universit	y of Florida, All F	Rights Reserved			HCS2010 ^{TN}	^A Versi	on 6.90		Generated:	6/18/2020 1:25

	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 Off & On Ramps
Analysis Time Period	AM		Analysis Year	2020 Bu	ild 2
Project Description SW 10t	th Street SIMR				
✓ Oper.(LOS))		Des.(N)	Pla	inning Data
Flow inputs					
Volume, V AADT	4420	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T	0.95 3	
Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	%RVs, P _R General Terrain: Grade % Length Up/Down %	0 Level mi	
Calculate Flow Adjusti	ments				
f _p	1.00		E _R	1.2	
E _T	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
Speed Inputs			Calc Speed Adj and FFS	3	
Lane Width		ft			_
Rt-Side Lat. Clearance		ft	f _{LW}		mph
Number of Lanes, N	3				mph
EES (mossured)	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 _p = (V or DDHV) / (PHF x N S D = v _p / S LOS	x f _{HV} x f _p) 1574 68.4 23.0 C	pc/h/ln mph pc/mi/ln	<u>Design (N)</u> Design LOS v _p = (V or DDHV) / (PHF x N x S D = v _p / S Required Number of Lanes, N	f _{HV} x f _p)	pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base fre pur volume	speed ee-flow speed	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2	13 2, 11-3	f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

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			FREEWAY	WEAV	ING WOF	RKSHEE	Т			
Genera	al Informati	on			Site Info	rmation				
Analyst Agency/Co Date Perfo Analysis T	ompany rmed ime Period	AECO AM	М		Freeway/Dir of TravelI-95 NBWeaving Segment LocationSeg 11-Bet On & Off to ExpAnalysis Year2020 Build 2					
Project De	scription SW 10t	h Street SIM	2							
Inputs					1					
Weaving configuration Two-Sided Weaving number of lanes, N 4 Weaving segment length, L _s 2970f Freeway free-flow speed, FFS 70 mph					Segment type Free Freeway minimum speed, S _{MIN} Freeway maximum capacity, C _{IFL} 2 Terrain type L					
Conve	rsions to p	<u>c/h Unde</u>	r Base Co	ondition	S					
	V (veh/h)	PHF	Truck (%)	RV (%)	Ε _Τ	E _R	f _{HV}	fp	v (pc/h)	
V _{FF}	3770	0.95	3	0	1.5	1.2	0.985	1.00	4028	
V _{RF}	1970	0.92	2	0	1.5	1.2	0.990	1.00	2163	
V _{FR}	650	0.92	2	0	1.5	1.2	0.990	1.00	714	
V _{RR}	340	0.92	2	0	1.5	1.2	0.990	1.00	373	
V _{NW}	6905							V =	7278	
V _W	373									
VR	0.051									
Config	uration Cha	aracteris	tics		1					
Minimum ı	maneuver lanes,	N _{WL}		0 lc	Minimum we	eaving lane cl	hanges, LC _{MIN}	1	1119 lc/h	
Interchang	je density, ID			0.7 int/mi	Weaving lan	e changes, L	.C _w		1612 lc/h	
Minimum	RF lane changes	LC _{RF}		0 lc/pc	Non-weaving lane changes, LC _{NW} 2					
Minimum	FR lane changes	LC _{FR}		0 lc/pc	Total lane ch	nanges, LC _{AL}	L		4075 lc/h	
Minimum I	RR lane changes	, LC _{RR}		3 lc/pc	Non-weaving	g vehicle inde	ex, I _{NW}		1436	
Weavir	ng Segmen ⁻	t Speed,	Density, I	_evel of	Service,	and Cap	oacity			
Weaving segment flow rate, v7186 veh/Weaving segment capacity, c8485 veh/					Weaving inte Weaving sec	ensity factor, gment speed	W , S		0.290 53.4 mph	
Weaving s	segment v/c ratio			0.847	Average wea	aving speed,	S _W		57.6 mph	
Weaving s	segment density,	D	34	4.1 pc/mi/ln	In Average non-weaving speed, S_{NW} 53.2				53.2 mph	
Level of S	ervice, LUS			D	Maximum weaving length, L _{MAX} 6205 ft					
Notes	segmente longer t	han the colour	ated maximum -	nath should	a tractod as is	colated moras	and divorce	and uning the	procedures of	
Chapter 13, b. For volur	, "Freeway Merge a	and Diverge Se e weaving seg	egments". ment capacity, th	<u>ne level of sei</u>	vice is <u>"F".</u>					

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	BASIC FRE	EWAY SE	GMENTS WORKSHEE	Г	
			1		
General Information			Site Information		
Analyst Agency or Company Date Performed	AECOM		Highway/Direction of Travel From/To	l I-95 NB Seg 12-No	orth of Hillsboro
Analysis Time Period	AM		Analysis Year	2020 Build	12
Project Description SW 1	0th Street SIM	7			
✓ Oper.(LOS)			es.(N)	🗌 Planni	ng Data
Flow Inputs					
Volume, V AADT	5740	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T	0.95 3	
Peak-Hr Prop. of AADT, K			%RVs, P _R	0	
DDHV = AADT x K x D		veh/h	General Terrain: Grade % Length Up/Down %	Levei mi	
Calculate Flow Adjus	tments				
f _p	1.00		E _R	1.2	
Ε _T	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$)] <i>0.985</i>	
Speed Inputs			Calc Speed Adj and F	FS	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f _{LW}		mph
Number of Lanes, N	4		f _{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			
LOS and Performance	e Measures		Design (N)		
Operational (LOS)			<u>Design (N)</u>		
$v_{x} = (V \text{ or } DDHV) / (PHF x)$	N x fuy		Design LOS		
$x f_{p}$)	^{nv} <i>15</i> 33	pc/h/ln	$v_p = (V \text{ or DDHV}) / (PHF x I)$	N x f _{HV}	pc/h/ln
S	68.7	mph	x f _p)		man h
$D = v_p / S$	22.3	pc/mi/ln	5 D - v / S		mpn na/mi/ln
LOS	С		Required Number of Lanes	, N	рслпілп
Glossary			Factor Location		
N - Number of lanes	S - Spee	t	E Exhibits 11 10 11 12	f	Exhibit 11.8
V - Hourly volume	D - Densi	ty	$E_{\rm R}^{-1}$ Exhibits 11-10, 11-12	ין 11-13 f	_W - Exhibit 11_0
v _p - Flow rate	FFS - Free	-flow speed	f - Page 11-18	ןי סי-יי ד	$\frac{1}{2} = \frac{1}{2} = \frac{1}$
LOS - Level of service speed	BFFS - Ba	se free-flow	LOS, S, FFS, v_p - Exhibits 7	11-2,	Taye 11-11
DDHV - Directional design	hour volume		11-3		

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		F	REEWA	Y WEAV	ING WOF	RKSHEE	Т				
Genera	al Informati	on			Site Information						
Analyst Agency/Co Date Perfo Analysis T	ompany ormed ime Period	AECOI PM	И		Freeway/Dir Weaving Seg Analysis Yea	Freeway/Dir of Travel I-95 NB Neaving Segment Location Seg 1-Bet Copans & Sampl Analysis Year 2020 Build 2					
Project De	scription SW 10t	h Street SIMF	2								
Inputs					1						
Weaving configuration One-Sided Weaving number of lanes, N 2 Weaving segment length, L _s 2380f Freeway free-flow speed, FFS 70 mpt					Segment type Free Freeway minimum speed, S _{MIN} Freeway maximum capacity, C _{IFL} 2 Terrain type Lu						
Conve	rsions to p	<u>c/h Unde</u>	r Base Co	ondition	S						
	V (veh/h)	PHF	Truck (%)	RV (%)	Ε _Τ	E _R	f _{HV}	fp	v (pc/h)		
V _{FF}	4265	0.95	3	0	1.5	1.2	0.985	1.00	4557		
V _{RF}	415	0.92	2	0	1.5	1.2	0.990	1.00	456		
V _{FR}	1560	0.92	2	0	1.5	1.2	0.990	1.00	1713		
V _{RR}	0	0.95	0	0	1.5	1.2	1.000	1.00	0		
V _{NW}	4557		-	-			-	V =	6726		
V _w	2169							-			
VR	0.322										
Config	uration Cha	aracteris	tics								
Minimum	maneuver lanes,	N _{WL}		2 lc	Minimum we	aving lane c	hanges, LC _{MIN}		2169 lc/h		
Interchang	ge density, ID			0.7 int/mi	Weaving lan	e changes, L	.C _w		2604 lc/h		
Minimum	RF lane changes	, LC _{RF}		1 lc/pc	Non-weaving	g lane chang	es, LC _{NW}		1458 lc/h		
Minimum	FR lane changes	, LC _{FR}		1 lc/pc	Total lane ch	nanges, LC _{AL}	L		4062 lc/h		
Minimum	RR lane changes	, LC _{RR}		lc/pc	Non-weaving	g vehicle inde	ex, I _{NW}		759		
Weavir	ng Segmen	t Speed,	Density,	Level of	Service,	and Cap	oacity				
Weaving s	segment flow rate	, V		6637 veh/h	Weaving inte	ensity factor,	W		0.345		
Weaving s	Neaving segment capacity, c _w 7332 veh					gment speed	, S		49.0 mph		
Weaving s	Veaving segment v/c ratio 0.90					aving speed,	S _w		55.9 mph		
Weaving s	segment density,	D	3	4.3 pc/mi/ln	Average non-weaving speed, S_{NW}				46.3 mph		
Level of S	Level of Service, LOS D					Maximum weaving length, L _{MAX} 5826 ft					
Notes											
a. Weaving	segments longer t	han the calcula	ited maximum le	ength should I	pe treated as is	solated 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 F	REEWAY SE	GMENTS WORKSHEET		
Conorol Information			Site Information		
			Highway/Direction of Travel		
Analysi Agapay ar Campany	45004			Seg 2-B	et Off & On from
Agency or Company	AECOM		From/To	Sample	
Date Performed Analysis Time Period	РМ		Jurisdiction Analysis Year	2020 Bu	uild 2
Project Description SW 10	0th Street SIMR				
Oper.(LOS	S)		Des.(N)	Pla	anning Data
Flow Inputs					
Volume, V	4680	veh/h	Peak-Hour Factor, PHF	0.95	
AADT		veh/day	%Trucks and Buses, P _T	3	
Peak-Hr Prop. of AADT, K			%RVs, P _R	0	
Peak-Hr Direction Prop, D		vob/b	General Terrain:	Level	
		ven/n	Grade % Length	mi	
Coloulate Flow Adius	4				
Calculate Flow Adjus	tments				
f _p	1.00		E _R	1.2	
Ε _T	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
Speed Inputs			Calc Speed Adj and FF	S	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f _{LW}		mph
Number of Lanes, N	3		f _{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFF	S	mph			·
LOS and Performance	e Measures		Design (N)		
			Design (N)		
Operational (LOS)			Design LOS		
$v_p = (V \text{ or } DDHV) / (PHF x N)$	N x f _{HV} x f _p) 1667	pc/h/ln	$v_{p} = (V \text{ or DDHV}) / (PHF x N x)$	(f _{HV} x f _n)	pc/h/ln
S	67.5	mph	S	nv p	mph
$D = v_p / S$	24.7	pc/mi/ln	$D = v_p / S$		pc/mi/ln
LOS	С		Required Number of Lanes, N		·
Glossary			Factor Location		
N - Number of lanes	S - Speed				
V - Hourly volume	D - Densitv		E _R - Exhibits 11-10, 11-12		t _{LW} - Exhibit 11-8
v _n - Flow rate	FFS - Free-flow	speed	E _T - Exhibits 11-10, 11-11, 11	-13	t _{LC} - Exhibit 11-9
LOS - Level of service	BFFS - Base fre	ee-flow speed	f _p - Page 11-18		TRD - Page 11-11
DDHV - Directional design I	hour volume	F	LOS, S, FFS, v _p - Exhibits 11-	2, 11-3	

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<u>No. Ln</u>	Capacity Check (see Exhibits 25-3 and 25-7):	Maximum	Actual	V/c	LOS F?
4	Fwy downstream of ramp (assume 70 mph free-flow speed) =	9,600	6,005	0.63	No
3	Fwy upstream of ramp (assume 70 mph free-flow speed) =	7,200	5,000	0.69	No
1	Capacity on On-Ramp (assume 45 mph free-flow speed) =	2,100	999	0.48	No

Site Information Site Information Sequence 1 for any is the performed point of Lanes, N Analysis Year 2020 Build 2 Market Sine Period PM Analysis Year 2020 Build 2 Preserve Number of Lanes, N 4 Downstream Adj Ramp Preserve Number of Lanes, N 4 Downstream Adj Ramp Preserve Number of Lanes, N 1 Downstream Adj Ramp Preserve Number of Lanes, N 1 Downstream Adj No Of the perform Adj Preserve Number of Lanes, N 1 Downstream Adj No Of the perform Adj Preserve Number of Lanes, N 1 Downstream Adj Preserve	RAMPS AND RAMP JUNCTIONS WORKSHEET										
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	General Infor	mation			Site Infor	mation					
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Analyst			Fr	eeway/Dir of Tr	ravel I-95 NB					
Date Performed Unstation Analysis Tear Provide Pit Analysis Year 2020 Build 2 Protect Description SW 10th Street SIMR Protect Description STR 100 Prote Protect Description STR 100 Protect	Agency or Company	AECO	MC	Ju	Inction		Seg 4	-On from Ex	(p		
Analysis Year 2020 Build 2 Indept Stand Add Ramp Freeway Number of Lanes, N 4 Protein Description Ramp Number of Lanes, N 1 Pres On Acceleration Lane Length, L, 1500 Protein Description Preeway Number of Lanes, N 1 Ramp Pres On Acceleration Lane Length, L, 1500 Presway State Prote Ramp Notice, Value 610 Presway State Presway State Va = veh/m Freeway State 610 Value 200 veh/h Presway State State 610 Value 200 veh/h Value 200 veh/h Conversion to pc/t Under Base Conditions Value 3 0 0.985 10.0 6005 Ramp 5500 0.96 Level 2 0 0.990 1.00 252 UpStream 230 0.92 Level 2 0 0.990 1.00 252 UpStream 230 0.92 Level 2 0 0.990 1.00 252 DownStream 230	Date Performed			Ju	irisdiction		Ū				
Project Description SW 10th Street SMR Inputs Freeway Number of Lanes, N 4 Downstream Adj If Yes On Accordination Lane Length L ₀ Street Street Image Street Street If No Orff Deceleration Lane Length L ₀ Street S	Analysis Time Period	I PM		Ar	nalysis Year		2020	Build 2			
$\begin{split} \hline previses & \\ \hline previses & Adj Ranp & Freeway Number of Lanes, N & 4 & Downstream Adj Ranp & Ramp Number of Lanes, N & 1 & Ramp & $	Project Description	SW 10th Stree	t SIMR								
upper beam Adj Ramp Freeway Number of Lanes. N 4 Downstream Adj Premay <	Inputs										
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Upstream Adi Ramp		Freeway Num	ber of Lanes, N	4					Downstre	am Adi
$ \begin{array}{ c c c c } Yes \ \ \ On \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ $	opoliouninaj rump		Ramp Numbe	r of Lanes, N	1					Ramp	
NoO offPreserve Volume, Vp5620NoNoOffVu =remeway Volume, Vp5620Vp =OffNoOffVu =remeway Free-Row Speed, Spr50.0Vp =230veh/hConversion to pc/h Under Base Conditions(poh)Vm / vFreeway Free-Row Speed, Spr50.0Conversion to pc/h Under Base Conditions(poh)Vm / vPHFTerrain 3% Truck%Rwfnvfp vV/v200.9851.006005Ramp Free-Row Speed, Spr50.0Conversion to pc/h Under Base Conditions(poh)Vm / vvVize Vr / fp vVize Vr / fp / vViz	Yes On	1	Acceleration I	ane Length, L.	1500						
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $			Deceleration I	ane Length I						i ves	L On
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	No □ Of	f			5600					🗌 No	✓ Off
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	- #			ine, v _F	5620					I. =	2950 ft
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	L _{up} – I		Ramp Volume	e, V _R	610					down	2000 11
Conversion to pc/h Under Base Conditions Conversion to pc/h Under Base Conditions (pch) $V_{(Ve)hn}$ PHF Terrain %Truck %Rv f_{HV} f_p $v = V/PHF x f_{stv} x f_p$ (pch) $V_{(Ve)hn}$ PHF Terrain %Truck %Rv f_{HV} f_p $v = V/PHF x f_{stv} x f_p$ Ramp 610 0.92 Level 2 0 0.990 1.00 6005 Ramp 610 0.92 Level 2 0 0.990 1.00 670 DownStream 20 0.92 Level 2 0 0.990 1.00 670 Merge Areas Diverge Areas Estimation of v_{12} V12 = V_R + (V_R - V_R)P_{FD} V12 = V_	V = veh/h		Freeway Free	-Flow Speed, S _{FF}	70.0					V_ =	230 veh/h
	u von,n		Ramp Free-Fl	ow Speed, S _{FR}	50.0					D	
$ \begin{array}{ c c c c } (pch) & V \\ (Veh)^{h}/r \\ PHF & Terrain & % Truck & % Rv & f_{FV} & f_p & v = V/PHF x f_{HV} x f_p \\ \hline Freeway & 5620 & 0.95 & Level & 3 & 0 & 0.985 & 1.00 & 6005 \\ \hline Ramp & 610 & 0.92 & Level & 2 & 0 & 0.990 & 1.00 & 670 \\ \hline UDSIteam & & & & & & & & & & & & & & & & & & &$	Conversion to	o pc/h Und	der Base	Conditions							
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	(pc/h)	V	PHF	Terrain	%Truck	%Rv		funz	f.	v = V/PHF	x funz x fu
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	(p 0,)	(Veh/hr)			,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		HV	·p		нутр
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Freeway	5620	0.95	Level	3	0	().985	1.00	6	005
Upstream 20 0.92 Level 2 0 0.990 1.00 252 Diverge Areas Diverge Areas Estimation of v_{12} Estimation of v_{12} Vi2 = V _R (P _{FM}) Estimation of v_{12} Use of $v_{12} = V_R + (V_F - V_R) P_{FD}$ Lex = Caquation 13-6 or 13-7) Vi2 = V _R (P _{FM}) Vi2 = V _R + (V _F - V _R) P _{FD} Use of $v_{12} = V_R + (V_F - V_R) P_{FD}$ Use of $v_{12} = V_R + (V_F - V_R) P_{FD}$ Use of $v_{12} = V_R + (V_F - V_R) P_{FD}$ Use of $v_{12} = V_R + (V_F - V_R) P_{FD}$ Use of $v_{12} = V_R + (V_F - V_R) P_{FD}$ Use of $v_{12} = V_R + (V_F - V_R) P_{FD}$ Use of $v_{12} = V_R + (V_F - V_R) P_{FD}$ Use of $v_{12} = V_R + (V_F - V_R) P_{FD}$ Use of $v_{12} = V_R + (V_F - V_R) P_{FD}$ Use of $v_{12} = V_R + (V_F - V_R) P_{FD}$ Use of $v_{12} = V_R + (V_F - V_R) P_{FD}$	Ramp	610	0.92	Level	2	0	().990	1.00	(570
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	UpStream		0.00								
Inverge Areas Diverge Areas Estimation of v_{12} Estimation of v_{12} $v_{12} = v_{12} + (P_{FM})$ $v_{12} = v_{R} + (V_F - V_R)P_{FD}$ $v_{12} = 0$ (Equation 13-6 or 13-7) $P_{FM} =$ 0.134 using Equation (Exhibit 13-6) $v_{12} =$ 805 pc/h $v_{12} =$ 2600 pc/h $v_{12} =$ 2600 pc/h $v_{12} =$ pc/h $v_{12} =$ $v_{12} =$ 2600 pc/h v_{3} or $v_{avd4} > 2.700$ pc/h (Equation 13-14 or 13-7) Is v_3 or $v_{avd4} > 2.700$ pc/h? Yes No Is v_3 or $v_{avd4} > 1.5 * v_{12}/2$ Yes No If Yes, $V_{12a} =$ 2.000 pc/h (Equation 13-16, 13-18, or 13-19) Capacity Checks Capacity Checks Capacity LOS F? v_{FO} 6675 Exhibit 13-8 No V_F Exhibit 13-8 v_{FO} 6675 Exhibit 13-8 V_R Exhibit 13-8 V_R v_{F12} 3360 Exhibit 13-8 VoR Exh	DownStream	230	0.92	Level	2	0	().990	1.00		252
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Estimation of	5.7	werge Areas			Ectimot	ion		Diverge Areas		
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $											
$\begin{array}{c c c c c c c c c c c c c c c c c c c $		V ₁₂ = V _F	(P _{FM})					$V_{10} = 1$	Vp + (Vr - Vp)P _{ED}	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	L _{EQ} =	(Equa	ation 13-6 o	r 13-7)		=		- 12	(Equation 13-	/* FD 12 or 13_1	3)
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	P _{FM} =	0.134	using Equat	tion (Exhibit 13-6)		EQ P =				n /Evhibit 13	2 7)
$\begin{array}{c c c c c c c } & & & & & & & & & & & & & & & & & & &$	$V_{12} =$	805 p	c/h			FD					<i>j</i> - <i>i</i>)
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $		2600	oc/h (Equati	on 13-14 or 13-		v ₁₂ -			pc/n		
	v ₃ or v _{av34}	17)				v ₃ or v _{av34}			pc/h (Equation 1	3-14 or 13-1	()
	Is V ₃ or V _{av34} > 2,70	0 pc/h? 🗌 Ye	s 🗹 No			Is V ₃ or V _{av}	₃₄ > 2,	700 pc/h? [∐Yes ∐No		
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Is V ₃ or V _{av34} > 1.5 *	[•] V ₁₂ /2	s 🗌 No			Is V ₃ or V _{av}	₃₄ > 1.	5 * V ₁₂ /2	Yes 🗌 No		
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $		2402	oc/h (Equati	on 13-16, 13-		If Yes,V _{12a} =	=	1	pc/h (Equation	n 13-16, 13	3-18, or
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	11 1 00, V _{12a} -	18, or	13-19)			120		1.	3-19)		
$ \begin{array}{ c c c c } \hline Actual & \hline Capacity & LOS F? & Actual & \hline Capacity & LOS F? \\ \hline V_{FO} & Actual & \hline V_F & Exhibit 13-8 & \hline V_F & V_F & V_F & V_F & \hline V_F & V_F & V_F & V_F & \hline V_F & V_F & V_F & V_F & \hline V_F & V_F & V_F & V_F & \hline V_F & V_F & V_F & V_F & V_F & \hline V_F & V_F & V_F & V_F & V_F & \hline V_F & V_F & V_F & V_F & \hline V_F & V_F & V_F & V_F & \hline V_F & V_F & V_F & V_F & V_F & \hline V_F & V_F & V_F & V_F & \hline V_F & V_F & V_F & V_F & \hline V_F & V_F & V_F & V_F & V_F & \hline V_F & V_F & V_F & V_F & V_F & V_F & \hline V_F & V_F & V_F & V_F & V_F & V_F & \hline V_F & \hline V_F & $	Capacity Che	cks				Capacit	y Ch	necks			
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $		Actual	0	Capacity	LOS F?			Actual	Cap	pacity	LOS F?
$ \begin{array}{ c c c c c } \hline V_{FO} & 6675 & Exhibit 13-8 & No & V_{FO} = V_F - V_R & Exhibit 13-8 & Interview is the exhibit 13-8 & Interview is the exhibit 13-8 & V_R & Interview is the exhibit 13-8 & Interview is the exhibit 13-8 & V_R & Interview is the exhibit 13-8 & Interview is the exhibit 13-8 & V_R & Interview is the exhibit 13-8 & V_R & Interview is the exhibit 13-8 & Volation? \\ \hline Flow Entering Merge Influence Area & Flow Entering Diverge Influence Area & Volation? & Actual & Max Desirable & Volation? & V_R & Interview is the exhibit 13-8 & Volation? & V_R & Interview is the exhibit 13-8 & Volation? & V_R & Volation? & V_R & Volation? & V_R & Volation? & V_R & Volation? & Volatio$						V _F			Exhibit 13-8	8	
FlowExhibit 100InteringExhibit 13- 10Exhibit 13- 10Flow Entering Diverge Influence AreaActualMax DesirableViolation?ActualMax DesirableViolation?VR123360Exhibit 13-84600:AllNoV12Exhibit 13-8Violation?VR123360Exhibit 13-84600:AllNoV12Exhibit 13-8Violation?DR5.475 + 0.00734 vR + 0.0078 V12 - 0.00627 LADR4.252 + 0.0086 V12 - 0.009 LDDRDR23.5 (pc/mi/ln)DR(pc/mi/ln)DS = (Exhibit 13-2)DS = (Exhibit 13-2)Speed DeterminationMS =0.283 (Exibit 13-11)DR =(Exhibit 13-12)SR =mph (Exhibit 13-11)So =66.2 mph (Exhibit 13-11)SR =mph (Exhibit 13-12)SR =mph (Exhibit 13-12)S =64.0 mph (Exhibit 13-13)S =mph (Exhibit 13-13)S =mph (Exhibit 13-13)	Vro	6675	Exhibit 13-8		No	$V_{FO} = V_{F}$	- V _R		Exhibit 13-8	8	
VR10Flow Entering Diverge Influence AreaActualMax DesirableViolation?ActualMax DesirableViolation?VR123360Exhibit 13-84600:AllNoV12Exhibit 13-8Violation?Level of Service Determination (if not F)Level of Service Determination (if not F)DR = 4.252 + 0.0086 V12 - 0.009 LDDRDR = 23.5 (pc/mi/ln)DR = (pc/mi/ln)DS = (Exhibit 13-2)DS = (Exhibit 13-2)DRVIOLATIONSpeed DeterminationMs =0.283 (Exibit 13-11)Speed DeterminationDs = (Exhibit 13-12)Sg = mph (Exhibit 13-11)Sg = mph (Exhibit 13-12)Sg = mph (Exhibit 13-12)Sp =66.2 mph (Exhibit 13-11)Sg = mph (Exhibit 13-12)Sg = mph (Exhibit 13-13)Sg = mph (Exhibit 13-13)	- FO	0010				V N			Exhibit 13	-	
Flow Entering Diverge Influence AreaActualMax DesirableViolation?ActualMax DesirableViolation? V_{R12} 3360Exhibit 13-84600:AllNo V_{12} Exhibit 13-8Violation?Level of Service Determination (if not F)Level of Service Determination (if not F)D_R = 4.252 + 0.0086 V_{12} - 0.009 L_DD_R = 4.252 + 0.0086 V_{12} - 0.009 L_D $D_R = 23.5 (pc/mi/ln)$ C (Exhibit 13-2) C (Exhibit 13-2) C (Exhibit 13-2) C (Exhibit 13-2) C (Exhibit 13-2)Speed Determination $M_S = 0.283 (Exibit 13-11)$ $S_R = 62.1 mph (Exhibit 13-11)$ $S_R = mph (Exhibit 13-12)$ $S_p = 66.2 mph (Exhibit 13-11)$ $S_p = mph (Exhibit 13-12)$ $S_p = mph (Exhibit 13-12)$ $S = 64.0 mph (Exhibit 13-13)$ $S = mph (Exhibit 13-13)$ $S = mph (Exhibit 13-13)$						۷R			10		
$\begin{tabular}{ c c c c c c c c c c } \hline Actual & Max Desirable & Violation? & Actual & Max Desirable & Violation? & V_{R12} & 3360 & Exhibit 13-8 & 4600:All & No & V_{12} & Exhibit 13-8 & & & & & & & \\ \hline V_{R12} & 3360 & Exhibit 13-8 & 4600:All & No & V_{12} & & & & & & & & & & & & & & & & & & &$	Flow Entering	g Merge In	fluence A	lrea		Flow En	iterii	ng Dive	rge Influen	ce Area	
V_{R12} 3360 Exhibit 13-8 4600:All No V_{12} Exhibit 13-8 Image: Constraint of the cons		Actual	Max	Desirable	Violation?			Actual	Max Desi	irable	Violation?
Level of Service Determination (if not F) Level of Service Determination (if not F) $D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ $D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R = 23.5 (pc/mi/ln)$ $D_R = (pc/mi/ln)$ $LOS = C (Exhibit 13-2)$ $LOS = (Exhibit 13-2)$ Speed Determination Speed Determination $M_S = 0.283 (Exibit 13-11)$ $D_S = (Exhibit 13-12)$ $S_R = 62.1 mph (Exhibit 13-11)$ $S_R = mph (Exhibit 13-12)$ $S_0 = 66.2 mph (Exhibit 13-11)$ $S_0 = mph (Exhibit 13-12)$ $S = 64.0 mph (Exhibit 13-13)$ $S = mph (Exhibit 13-13)$	V _{R12}	3360	Exhibit 13-8	4600:All	No	V ₁₂			Exhibit 13-8		
$\begin{array}{llllllllllllllllllllllllllllllllllll$	Level of Serv	ice Detern	nination (if not F)		Level of	f Ser	vice De	terminatio	n (if not	F)
$D_R = 23.5 (pc/mi/ln)$ $D_R = (pc/mi/ln)$ $LOS = C (Exhibit 13-2)$ $LOS = (Exhibit 13-2)$ Speed Determination Speed Determination $M_S = 0.283 (Exibit 13-11)$ $D_s = (Exhibit 13-12)$ $S_R = 62.1 mph (Exhibit 13-11)$ $S_R = mph (Exhibit 13-12)$ $S_0 = 66.2 mph (Exhibit 13-11)$ $S_0 = mph (Exhibit 13-12)$ $S = 64.0 mph (Exhibit 13-13)$ $S = mph (Exhibit 13-13)$	D _R = 5.475 +	$D_{p} = 5.475 + 0.00734 v_{p} + 0.0078 V_{12} - 0.00627 L_{A}$ $D_{p} = 4.252 + 0.0086 V_{12} - 0.009 L_{p}$									
$LOS = C$ (Exhibit 13-2) $LOS = (Exhibit 13-2)$ Speed DeterminationSpeed Determination $M_S = 0.283$ (Exibit 13-11) $D_s = (Exhibit 13-12)$ $S_R = 62.1$ mph (Exhibit 13-11) $S_R = mph$ (Exhibit 13-12) $S_0 = 66.2$ mph (Exhibit 13-11) $S_0 = mph$ (Exhibit 13-12) $S = 64.0$ mph (Exhibit 13-13) $S = mph$ (Exhibit 13-13)	$D_{\rm p} = 23.5 ({\rm pc/m})$	i/ln)	12	~		D _p = (r)c/mi/	′ln)	12	U	
Los = CLXHIBIT 13-27 Speed Determination Speed Determination $M_s =$ 0.283 (Exibit 13-11) $S_R =$ 62.1 mph (Exhibit 13-11) $S_0 =$ 66.2 mph (Exhibit 13-11) $S =$ 64.0 mph (Exhibit 13-13)	R = C (Fxhibit)	13_2)				-R (P	zvhihi	it 13_2)			
Speed Determination Speed Determination $M_{\rm S}$ = 0.283 (Exibit 13-11) $D_{\rm s}$ = (Exhibit 13-12) $S_{\rm R}$ = 62.1 mph (Exhibit 13-11) $S_{\rm R}$ = mph (Exhibit 13-12) $S_{\rm 0}$ = 66.2 mph (Exhibit 13-11) $S_{\rm 0}$ = mph (Exhibit 13-12) $S = 64.0$ mph (Exhibit 13-13) $S = mph$ (Exhibit 13-13)											
$M_S =$ 0.283 (Exibit 13-11) $D_s =$ (Exhibit 13-12) $S_R^=$ 62.1 mph (Exhibit 13-11) $S_R^=$ mph (Exhibit 13-12) $S_0^=$ 66.2 mph (Exhibit 13-11) $S_0^=$ mph (Exhibit 13-12) $S =$ 64.0 mph (Exhibit 13-13) $S =$ mph (Exhibit 13-13)	Speed Detern	nination				speea L	Jete	rminatio	ก		
$S_R^{=}$ 62.1 mph (Exhibit 13-11) $S_R^{=}$ mph (Exhibit 13-12) $S_0^{=}$ 66.2 mph (Exhibit 13-11) $S_0^{=}$ mph (Exhibit 13-12) $S =$ 64.0 mph (Exhibit 13-13) $S =$ mph (Exhibit 13-13)	M _S = 0.283 (Exil	bit 13-11)				D _s = (E	xhibit	13-12)			
S_0 = 66.2 mph (Exhibit 13-11) S_0 = mph (Exhibit 13-12) S = 64.0 mph (Exhibit 13-13) S = mph (Exhibit 13-13)	S _R = 62.1 mph ((Exhibit 13-11)				S _R = m	ph (Ex	(hibit 13-12)			
S = 64.0 mph (Exhibit 13-13) S = mph (Exhibit 13-13)	S ₀ = 66.2 mph ((Exhibit 13-11)				S ₀ = m	ph (Ex	(hibit 13-12)			
	S = 64.0 mph ((Exhibit 13-13)				S= m	ph (Ex	(hibit 13-13)			

		RAMP	S AND RAM	P JUNCTI	ONS WO	RKS	HEET			
General Info	rmation			Site Infor	mation					
Analyst			Fre	eeway/Dir of Tr	avel	I-95 NE	3			
Agency or Company	AECO	MC	Ju	nction		Seg 5-	Off to Exp f	rom GPL		
Date Performed			Ju	risdiction		-				
Analysis Time Perio	d PM		An	alysis Year		2020 B	uild 2			
Project Description	SW 10th Stree	t SIMR								
Inputs									i	
Upstream Adj F	Ramp	Freeway Nun	nber of Lanes, N	4					Downstrea	am Adj
	·	Ramp Numbe	er of Lanes, N	1					Ramp	,
Yes 🖸	🗸 On	Acceleration	Lane Length, L						Vac	
	_] Off	Eroowov Volu		6020					🗹 No	Off
	250 ft		ine, v _F	0230					I. =	ft
	950 H	Ramp Volum	e, v _R	230					down	
V = 6'	10 veh/h	Freeway Free	e-Flow Speed, S _{FF}	70.0					V _D =	veh/h
		Ramp Free-F	low Speed, S _{FR}	45.0						
Conversion t	to pc/h Und	der Base	Conditions						н. -	
(nc/h)	V	DHE	Terrain	%Truck	%Pv		f	f	v = V/PHF	xf xf
(pc/ii)	(Veh/hr)		Tenain	70 TTUCK	/0111		'HV	'p	V V/I I II	Λ'HV Λ'p
Freeway	6230	0.95	Level	3	0	0.	985	1.00	66	56
Ramp	230	0.92	Level	2	0	0.	990	1.00	25	52
UpStream	610	0.92	Level	2	0	0.	990	1.00	67	70
DownStream										
		Merge Areas				-		liverge Areas		
Estimation o	t v ₁₂				Estimat	ion o	of V ₁₂			
	V ₁₂ = V _F	(P _{FM})					V ₁₂ =	V _R + (V _F - \	/ _R)P _{FD}	
L _{E0} =	(Equa	ition 13-6 or	13-7)		L _{E0} =		(I	Equation 13-	12 or 13-13)
P=	usina	Equation (Fxhibit 13-6)				0,	436 Usina Fa	nuation (Exhi	, hit 13-7)
	nc/h						0. 20	W/ no/h		
12	po/h	Faultion 10) 11 ar 10 17)		$\sqrt{12}$		10	144 pc/m		
$v_3 \text{ or } v_{av34}$	рс/п (1 00 /h 0		-14 01 13-17)		v ₃ 01 v _{av34}		۲۵ ۲۰۰۲ میں ۱۳۵۰	006 pc/n (Eq	uation 13-14	FOF 13-17)
IS V_3 or $V_{av34} > 2,70$		s 🗌 No			IS V ₃ OF V _{av}	₃₄ > 2,7		Yes ⊻No		
Is V_3 or $V_{av34} > 1.5$	* V ₁₂ /2 Yes	s 🗌 No			Is V ₃ or V _{av}	₃₄ > 1.5	* V ₁₂ /2	Yes 🗹 No		
lf Yes,V _{12a} =	pc/h (13 10)	Equation 13	3-16, 13-18, or		If Yes,V _{12a} =	=	p	c/h (Equatio	n 13-16, 13-	18, or 13-
Canacity Ch	10-19)				Canacit	v Ch	ocks	9)		
	Actual		Panaoit <i>u</i>			y cn	Actual		'anaaitu	
	Actual			LUGF?	V		Actual			
					V _F		0000		-0 9000	INO
V _{FO}		Exhibit 13-8			$V_{FO} = V_{F}$	- V _R	6404	Exhibit 13	-8 9600	No
					V _R		252	Exhibit 13-	10 2100	No
Flow Enterin	a Merae In	fluence A	Area		Flow En	nterin	g Diver	rge Influei	nce Area	
	Actual	Max	Desirable	Violation?			Actual	Max Desira	able	Violation?
V _{P12}		Exhibit 13-8			V ₁₂		3044	Exhibit 13-8	4400:All	No
Level of Service Determination (if not E)					l evel of	f Ser	vice De	terminatio	n (if not	F)
$D_{-} = 5.475 \pm 0.00734 \text{ y}_{-} \pm 0.0078 \text{ y}_{-} = 0.00627 \text{ J}_{-}$										
$D_R = 3.475 \pm 0.00734 \text{ v}_R \pm 0.0076 \text{ v}_{12} \pm 0.00027 \text{ L}_A$						$D_R = -$, ., .	.0000 v ₁₂ - 0		
$D_R = (pc/mi/ir)$	$D_R = (pc/m/m)$									
LOS = (Exhibit	$LOS = (Exhibit 13-2) \qquad \qquad LOS = D (Exhibit 13-2)$									
Speed Deter	Speed L	Deter	minatio	n						
M _o = (Exibit 13-11)					D _s = 0.	321 (E	xhibit 13-	12)		
$S_{n} = mnh (Evi$	hihit 13_11)				S _R = 6 ⁴	1.0 mph	(Exhibit	13-12)		
	hibit $12 \cdot 11$				S_= 7	3 6 mnh	(Exhibit	, 13-12)		
S = mnh (Exi	$\frac{101110-11}{10110}$				S - 6	7.2 mrk		12 12		
						r.ompr		13-13)	<u> </u>	
yrignt © 2016 Universi	ty ot ⊢iorida, All R	ignts Reserved			HCS2010	" Versi	on 6.90		Generated: 6	o/18/2020 1:10

	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed	AECOM		Highway/Direction of Travel From/To Jurisdiction	I-95 NB Seg 6-Se	outh of Off to 10th
Analysis Time Period	PM h Street SIMP		Analysis Year	2020 Bu	110 2
	IT SLIEEL SIMIK				unning Data
Flow Inputs			Jes.(III)		
Volume, V	6000	veh/h veh/dav	Peak-Hour Factor, PHF %Trucks and Buses, P+	0.95 3	
Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	%RVs, P _R General Terrain: Grade % Length Up/Down %	0 Level mi	
Calculate Flow Adjustr	nents				
f _p E _T	1.00 1.5		E _R f _{LV/} = 1/[1+P _T (E _T - 1) + P _P (E _P - 1)]	1.2 0.985	
Speed Inputs			Calc Speed Adi and FFS	3	
Lane Width Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured) Base free-flow Speed, BFFS	4 70.0	ft ft ramps/mi mph mph	f _{LW} f _{LC} TRD Adjustment FFS	70.0	mph mph mph mph
LOS and Performance	Measures		Design (N)		
<u>Operational (LOS)</u> v _p = (V or DDHV) / (PHF x N : S D = v _p / S LOS	x f _{HV} x f _p) 1603 68.1 23.5 C	pc/h/ln mph pc/mi/ln	$\frac{\text{Design (N)}}{\text{Design LOS}}$ $v_p = (V \text{ or DDHV}) / (PHF x N x)$ S $D = v_p / S$ Required Number of Lanes, N	f _{HV} x f _p)	pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base free our volume	speed ee-flow speed	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2	13 2, 11-3	f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

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	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed	AECOM		Highway/Direction of Travel From/To Jurisdiction	I-95 NB Seg 8-B	et Off & Off Ramps
Analysis Time Period	PM h Street SIMP		Analysis Year	2020 Bu	110 2
	IT SLIEEL SIMIK				unning Data
Flow Inputs			Jes.(III)		
Volume, V AADT	4940	veh/h veh/dav	Peak-Hour Factor, PHF %Trucks and Buses, P _T	0.95 3	
Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	%RVs, P _R General Terrain: Grade % Length Up/Down %	0 Level mi	
Calculate Flow Adjustr	nents				
f _p Ε _T	1.00 1.5		E _R f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	1.2 0.985	
Speed Inputs			Calc Speed Adj and FFS	6	
Lane Width Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured) Base free-flow Speed, BFFS	3 70.0	ft ft ramps/mi mph mph	f _{LW} f _{LC} TRD Adjustment FFS	70.0	mph mph mph mph
LOS and Performance	Measures		Design (N)		
<u>Operational (LOS)</u> v _p = (V or DDHV) / (PHF x N) S D = v _p / S LOS	x f _{HV} x f _p) 1759 66.4 26.5 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 _{HV} x f _p)	pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base free our volume	speed ee-flow speed	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2	13 2, 11-3	f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

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	RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Infor	rmation			Site Infor	mation					
Analyst			Fr	eeway/Dir of Tr	Fravel I-95 NB					
Agency or Company	AEC	OM	Ju	inction		Seg 9-	Off to Hillsb	oro EB&WB		
Date Performed	d DM		Ju	risdiction		2020 0				
Project Description	SW 10th Stree		AI	alysis teal		2020 B				
Inputs										
		Freeway Num	ber of Lanes N	3						• "
Upstream Adj H	lamp	Ramn Numbe	er of Lanes N	1					Downstre	am Adj
Yes	On		and Longth	I						_
		Deceleration	Lane Length, L _A	200					I ✓ Yes	l On
I No □	Off			200					🗌 No	Off
	1	Freeway volu	ime, v _F	4940					1. =	2100 ft
L Lup	L	Ramp Volume	e, V _R	1250					-down	2100 10
V = v	eh/h	Freeway Free	e-Flow Speed, S _{FF}	70.0					V _D =	1200 veh/h
u		Ramp Free-F	low Speed, S _{FR}	45.0					_	
Conversion t	o pc/h Un	<u>der Base</u>	Conditions							
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv		f _{HV}	f _p	v = V/PHF	x f _{HV} x f _p
Freeway	4940	0.95	Level	3	0	0.	985	1.00	52	278
Ramp	1250	0.92	Level	2	0	0.	990	1.00	1	372
UpStream										
DownStream	1200	0.92	Level	2	0	0.	990	1.00	1	317
Estimation of	F 1, <i>f</i>	Merge Areas			Ectimot	lion o	<u> </u>	liverge Areas		
Estimation of	v 12				Estimat		12			
	V ₁₂ = V _F	(P _{FM})					V ₁₂ =	۷ _R + (۷ _F - ۱	/ _R)P _{FD}	
L _{EQ} =	(Equa	ation 13-6 or	13-7)		L _{EQ} =		(1	Equation 13-	12 or 13-13	3)
P _{FM} =	using	Equation (Exhibit 13-6)		P _{FD} =		0.	565 using E	quation (Exh	iibit 13-7)
V ₁₂ =	pc/h				V ₁₂ =		35	579 pc/h		
V ₃ or V _{av34}	pc/h (Equation 13	-14 or 13-17)		$V_3^{}$ or $V_{av34}^{}$		16	699 pc/h (Eq	uation 13-1	4 or 13-17)
Is V_3 or $V_{av34} > 2,70$	00 pc/h? 🗌 Ye	s 🗌 No			Is V_3 or V_{av}	_{/34} > 2,7	00 pc/h?	Yes 🗹 No)	
Is V_3 or $V_{av34} > 1.5$	* V ₁₂ /2 🗌 Ye	s 🗌 No			Is V_3 or V_{av}	, ₃₄ > 1.5	* V ₁₂ /2	Yes 🗹 No)	
If Yes,V _{12a} =	pc/h (Equation 13	-16, 13-18, or		If Yes,V _{12a} =	=	p	c/h (Equatio	n 13-16, 13	-18, or 13-
Canacity Che)			Canacit	v Ch	ocks	9)		
	Actual		anacity	LOS F2		<u>y Ch</u>	Actual		anacity	LOS F2
	/ total	† – †	Jupuolity	2001.	V_		5278	Exhibit 13	-8 7200	No
V		Evhibit 13.8			V = V	- V	3006	Exhibit 13	8 7200	No
* FO					FO F	R T	1070		-0 7200	NU
			•				1372	Exhibit 13-	10 2100	INO
Flow Entering	g merge in	Tiuence A	Area Desirable	Violation?	Flow Er	nterin	of up l	Max Dasir	nce Area	Violation?
V	Actual	IVIAX	Desirable	violation?	V			Evhibit 12.9		VIOIALION?
	l vico Dotorr	nination ((if not E)			f Sor		torminatio	4400.All	
$D = 5.475 \pm 0.00734 \text{ y} \pm 0.0078 \text{ y} = 0.00627 \text{ y}$					Levero		1252 + 0			<i>r)</i>
$D_R = 0.470 + 0.1$.00704 V R '	0.0070 12	0.00027 L _A		D - 2'	20 (ma	/mai/lm)	.0000 • 12 - 0		
$D_R = (pc/m/m)$	1) 42.0\				$D_R = 3$	o.z (pc	/mi/in)			
LUS - (EXTINUL IS-2)										
Speed Determination					Speed L	Jeter		<u>on</u>		
™ _S = (Exibit 1	3-11)				$D_{s} = 0.$.4∠1 (E		·12)		
S _R = mph (Exh	nibit 13-11)				S_{R}^{-} 50	o.2 mph	(Exhibit	13-12)		
S ₀ = mph (Exh	nibit 13-11)				$S_0 = 74$	4.1 mph	(Exhibit	13-12)		
S = mph (Exh	13-13) tidit				S = 62	2.5 mph	(Exhibit	13-13)		
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	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed	AECOM		Highway/Direction of Travel From/To Jurisdiction	l-95 NB Seg 10-l	Bet Off & On Ramps
Analysis Time Period	PM		Analysis Year	2020 Bu	ild 2
Project Description SW 10th	h Street SIMR				
✓ Oper.(LOS)			Des.(N)	∐ Pla	inning Data
Flow Inputs					
Volume, V AADT	3690	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T	0.95 3	
Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	%RVs, P _R General Terrain: Grade % Length Up/Down %	0 Level mi	
Calculate Flow Adjustr	nents				
f _p	1.00		E _R	1.2	
E _T	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
Speed Inputs			Calc Speed Adj and FFS	3	
Lane Width		ft	f		mph
Number of Lanes N	3	п	'LW fu o		mph
Total Ramp Density, TRD	0	ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			
LOS and Performance	Measures		Design (N)		
<u>Operational (LOS)</u> v _p = (V or DDHV) / (PHF x N : S D = v _p / S LOS	x f _{HV} x f _p) 1314 69.8 18.8 C	pc/h/ln mph pc/mi/ln	Design (N) Design LOS v _p = (V or DDHV) / (PHF x N x S D = v _p / S Required Number of Lanes, N	f _{HV} x f _p)	pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base free our volume	speed ee-flow speed	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2	13 2, 11-3	f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

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		F	REEWAY	WEAV	ING WOF	RKSHEE	Т		
Genera	I Informati	on			Site Info	rmation			
Analyst Agency/Co Date Perfo Analysis Ti	Analyst Agency/Company AECOM Date Performed Analysis Time Period PM					of Travel gment Locati r	I-95 N on Seg 1 2020	IB 1-Bet On & C Build 2	Off to Exp
Project Des	scription SW 10t	h Street SIMF	2						
Inputs					•				
Weaving co Weaving n Weaving se Freeway fre	onfiguration umber of lanes, N egment length, L ee-flow speed, F	N s FS		Two-Sided 4 2970ft 70 mph	Segment typ Freeway min Freeway ma: Terrain type	e imum speed ximum capac	, S _{MIN} sity, C _{IFL}		Freeway 15 2400 Leve
Conver	rsions to p	c/h Unde	r Base Co	ondition	S		•	Ĩ.	
	V (veh/h)	PHF	Truck (%)	RV (%)	E _T	E _R	f _{HV}	fp	v (pc/h)
V _{FF}	3198	0.95	3	0	1.5	1.2	0.985	1.00	3417
V _{RF}	2132	0.92	2	0	1.5	1.2	0.990	1.00	2341
V _{FR}	492	0.92	2	0	1.5	1.2	0.990	1.00	540
V _{RR}	328	0.92	2	0	1.5	1.2	0.990	1.00	360
V _{NW}	6298			-			-	V =	6658
V _W	360							-	
VR	0.054								
Config	uration Cha	aracteris	tics		•				
Minimum r	maneuver lanes,	N _{WL}		0 lc	Minimum we	aving lane c	hanges, LC _{MIN}	I	1080 lc/h
Interchang	e density, ID			0.7 int/mi	Weaving lan	e changes, L	-C _W		1573 lc/h
Minimum F	RF lane changes,	LC _{RF}		0 lc/pc	Non-weaving	g lane chang	es, LC _{NW}		2150 lc/h
Minimum F	R lane changes,	LC _{FR}		0 lc/pc	Total lane ch	nanges, LC _{AL}	L		3723 lc/h
Minimum F	RR lane changes	, LC _{RR}		3 lc/pc	Non-weaving	g vehicle inde	ex, I _{NW}		1309
Weavin	ng Segmen ⁻	t Speed,	Density, I	_evel of	Service,	and Cap	oacity		
Weaving segment flow rate, v6576 veh/hWeaving segment capacity, cw8473 veh/h					Weaving inte Weaving seg	ensity factor, gment speed	W , S		0.270 54.4 mph
Weaving s	egment v/c ratio			0.776	Average wea	aving speed,	S _W		58.3 mph
Weaving segment density, D 30.6 pc/mi/lr					Average nor	n-weaving sp	eed, $S_{_{NW}}$		54.2 mph
Level of Se	ervice, LOS			D	Maximum w	eaving length	n, L _{MAX}		6232 ft
Notes	a a mara na fara a secondaria da secondaria d	han tha!- !	te d mention of the				and diverse-		ana adum f
a. vveaving Chapter 13, b. For volum	Segments longer t "Freeway Merge a nes that exceed the	nan the calcula and Diverge Se e weaving segi	egments". <u>ment capacity, the second second</u>	ngth should l	vice is "F".	solated merge	and diverge ar	eas using the	procedures of

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	BASIC FRE	EWAY SE		Г	
General Information			Site Information		
Analyst Agency or Company Date Performed	AECOM		Highway/Direction of Travel From/To	I-95 NB Seg 12-Nor	th of Hillsboro
Analysis Time Period	PM		Analysis Year	2020 Build 2	2
Project Description SW 1	Oth Street SIMI	R			
Oper.(LOS)			es.(N)	Plannin	g Data
Flow Inputs					
Volume, V AADT	5330	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T	0.95 3	
Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	%RVs, P _R General Terrain: Grade % Length Up/Down %	0 Level mi	
Calculate Flow Adjus	tments				
f _n	1.00		E _R	1.2	
E _T	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$] 0.985	
Speed Inputs			Calc Speed Adj and F	FS	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f, M		mph
Number of Lanes, N	4		f _L		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			
LOS and Performanc	e Measures		Design (N)		
Operational (LOS)			<u>Design (N)</u> Design LOS		
v _p = (v or DDnv)/ (FDF X) x f _p)	1424 N X I _{HV}	pc/h/ln	v _p = (V or DDHV) / (PHF x N x f)	N x f _{HV}	pc/h/In
S	69.4	mph	<pre></pre>		mph
$D = v_p / S$	20.5	pc/mi/ln	D = v / S		nc/mi/ln
LOS	С		Required Number of Lanes	, N	polinian
Glossary			Factor Location		
N - Number of lanes	S - Speed	d	E Evhibita 11 10 11 10	£	Eyhihit 11 0
V - Hourly volume	D - Densi	ty	$E_{\rm R}$ - Exhibits 11-10, 11-12	LV 11 12 f	V - EXHIDIL 11-0
v _n - Flow rate	FFS - Free	-flow speed	$E_{T} = EXMIDILS + 1 - 10, + 1 - 11,$	11-13 I _{LO}	- Exhibit 11-9
LOS - Level of service speed	BFFS - Bas	se free-flow	LOS, S, FFS, v _p - Exhibits 1	11-2,	RD - Page 11-11
DDHV - Directional design	hour volume		11-3		

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	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	AECOM		Highway/Direction of Travel From/To Jurisdiction Analysis Year	I-95 SB Seg 1-B 2020 Bu	et Hillsboro & Palmetto
Project Description SW 10th	h Street SIMR			2020 Du	110 Z
✓ Oper.(LOS)			Des.(N)	Pla	anning Data
Flow Inputs					0
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D	4580	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain:	0.95 3 0 Level	
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	mi	
Calculate Flow Adjustr	nents				
f _p	1.00		E _R	1.2	
Ε _T	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
Speed Inputs			Calc Speed Adj and FFS	6	
Lane Width Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD	4	ft ft ramps/mi	f _{LW} f _{LC} TRD Adjustment		mph mph mph
FFS (measured) Base free-flow Speed, BFFS	70.0	mph mph	FFS	70.0	mph
LOS and Performance	Measures		Design (N)		
<u>Operational (LOS)</u> v _p = (V or DDHV) / (PHF x N : S D = v _p / S LOS	x f _{HV} x f _p) 1223 70.0 17.5 B	pc/h/ln mph pc/mi/ln	<u>Design (N)</u> Design LOS v _p = (V or DDHV) / (PHF x N x S D = v _p / S Required Number of Lanes, N	f _{HV} x f _p)	pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base free our volume	speed ee-flow speed	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2	-13 2, 11-3	f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

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		F	REEWAY	WEAV	ING WOF	RKSHEE	Г		
Genera	Informati	on			Site Info	rmation			
Analyst Agency/Cor Date Perfor Analysis Tir	Analyst Agency/Company AECOM Date Performed Analysis Time Period AM					of Travel gment Locatio	195/S on Seg 2 2020	B 2-Bet On from Build 2	Exp & Off
Project Des	cription SW 10t	h Street SIMF	R						
Inputs					•				
Weaving co Weaving nu Weaving se Freeway fre	nfiguration mber of lanes, N gment length, L e-flow speed, F	N s FS		Two-Sided 4 3900ft 70 mph	Segment typ Freeway min Freeway ma: Terrain type	e imum speed, ximum capac	, S _{MIN} ity, C _{IFL}		Freeway 15 2400 Level
Conver	sions to p	c/h Unde	r Base Co	ondition	S		1	1	
	V (veh/h)	PHF	Truck (%)	RV (%)	Ε _Τ	E _R	f _{HV}	fp	v (pc/h)
V _{FF}	3460	0.95	3	0	1.5	1.2	0.985	1.00	3697
V _{RF}	850	0.92	2	0	1.5	1.2	0.990	1.00	933
V _{FR}	1120	0.92	2	0	1.5	1.2	0.990	1.00	1230
V _{RR}	90	0.92	2	0	1.5	1.2	0.990	1.00	99
V _{NW}	5860							V =	5959
V _W	99								
VR	0.017								
Configu	ration Cha	aracterist	tics		1				
Minimum m	aneuver lanes,	N _{WL}		0 lc	Minimum we	eaving lane cl	nanges, LC _{MIN}		297 lc/h
Interchange	e density, ID			0.7 int/mi	Weaving lan	e changes, L	.C _W		869 lc/h
Minimum R	F lane changes,	LC _{RF}		0 lc/pc	Non-weaving	g lane chang	es, LC _{NW}		2756 lc/h
Minimum F	R lane changes,	LC _{FR}		0 lc/pc	Total lane ch	nanges, LC _{AL}	L		3625 lc/h
Minimum R	R lane changes	, LC _{RR}		3 lc/pc	Non-weaving	g vehicle inde	ex, I _{NW}		1600
Weavin	g Segmen ⁻	t Speed,	Density, l	_evel of	Service,	and Cap	oacity		
Weaving segment flow rate, v5882 veh/hWeaving segment capacity, cw8859 veh/h					Weaving inte Weaving sec	ensity factor, gment speed,	W , S		0.213 60.7 mph
Weaving segment v/c ratio 0.66					Average wea	aving speed,	S _W		60.3 mph
Weaving segment density, D 24.5 pc/mi/lr					Average nor	n-weaving sp	eed, S _{NW}		60.7 mph
Level of Se	rvice, LOS			С	Maximum we	eaving length	i, L _{max}		5881 ft
Notes	annanta lauras d	han tha!'	ted manufacture 1				and diverses		nno o duna - af
a. vveaving s Chapter 13, ' b. For volum	Freeway Merge a sthat exceed the	nan the calcula and Diverge Se e weaving segr	egments". "gments". ment capacity, th	ngth should l	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	I-95 SB Seg 3-B	et Off & On Ramp
Project Description SW 10t	th Street SIMR		Analysis Teal	2020 Bu	
✓ Oper.(LOS))		Des.(N)	Pla	nning Data
Flow Inputs	, 				
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D	4310	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade % Length	0.95 3 0 Level mi	
		ven/n	Up/Down %	1111	
Calculate Flow Adjustr	ments				
f _p	1.00		E _R	1.2	
Ε _T	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
Speed Inputs			Calc Speed Adj and FFS	6	
Lane Width Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured) Base free-flow Speed, BFFS	3 70.0	ft ft ramps/mi mph mph	f _{∟w} f _{LC} TRD Adjustment FFS	70.0	mph mph mph mph
LOS and Performance	Measures		Design (N)		
<u>Operational (LOS)</u> v _p = (V or DDHV) / (PHF x N S D = v _p / S LOS	x f _{HV} x f _p) 1535 68.7 22.3 C	pc/h/ln mph pc/mi/ln	<u>Design (N)</u> Design LOS v _p = (V or DDHV) / (PHF x N x S D = v _p / S Required Number of Lanes, N	f _{HV} x f _p)	pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base fre our volume	speed ee-flow speed	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2	13 2, 11-3	f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

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		RAMP	S AND RAM	P JUNCTI	ONS WO	RKS	HEET			
General Infor	rmation			Site Infor	mation					
Analyst			Fr	eeway/Dir of Tr	avel	I-95 SE	}			
Agency or Company	AEC	OM	Ju	inction		Seg 4-I	Diverge to S	SW 10th St		
Date Performed			Ju	risdiction		0000 0	14.0			
Project Description	U AIVI		AI	alysis rear		2020 B				
Innuts										
mputs		Freeway Num	ber of Lanes N	3						
Upstream Adj F	Ramp	Ramo Numbe	ar of Lanes N	1					Downstre	am Adj
Yes	On			I						
		Acceleration	Lane Length, L _A						🗹 Yes	🗹 On
I No □	Off			200					🗌 No	Off
	5 4	Freeway Volu	ime, V _F	4310					. =	2400 ft
	π	Ramp Volume	e, V _R	1100					-down	2400 IL
V = v	eh/h	h/h Freeway Free-Flow Speed, S _{FF} 70.							V _D =	1290 veh/h
[•] u •	Ramp Free-Flow Speed, S _{FR} 45									
Conversion to pc/h Under Base Conditions				2						
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv		f _{HV}	f _p	v = V/PHF	⁻ x f _{HV} x f _p
Freeway	4310	0.95	Level	3	0	0.	985	1.00	4	605
Ramp	1100	0.92	Level	2	0	0.	990	1.00	1:	208
UpStream										
DownStream	1290	0.92	Level	2	0	0.	990	1.00	1	416
		Merge Areas					C	iverge Areas		
Estimation of	f v ₁₂				Estimat	ion o	of v ₁₂			
	V ₁₂ = V _F	(P _{FM})					V ₁₂ =	V _R + (V _F - \	/ _R)P _{FD}	
L _{EQ} =	(Equa	ation 13-6 or	13-7)		L _{EQ} =		(Equation 13-	-12 or 13-13	3)
P _{FM} =	using	Equation (Exhibit 13-6)		P _{FD} =		0.	589 using E	quation (Exh	ibit 13-7)
V ₁₂ =	pc/h				V ₁₂ =		32	10 pc/h		
V_3 or V_{av34}	pc/h (Equation 13	-14 or 13-17)		V_3 or V_{av34}		13	195 pc/h (Eq	uation 13-1	4 or 13-17)
Is V_3 or $V_{3\sqrt{34}} > 2,70$	00 pc/h? 🗌 Ye	s 🗌 No			Is V ₃ or V ₃	₃₄ > 2,7	00 pc/h? [Yes √ No)	,
Is V_3 or $V_{av34} > 1.5$	* V ₁₂ /2 Ye	s 🗌 No			Is V ₃ or V ₃	_{عم} > 1.5	* V ₁₂ /2	Yes Vo)	
	pc/h (Equation 13	-16, 13-18, or			-	12 –	c/h (Equatio	n 13-16, 13	-18, or 13-
11 1 03, V _{12a} -	13-19)				11 1 C3, V 12a		- 19	9)		
Capacity Che	ecks	1			Capacit	y Ch	ecks			
	Actual		Capacity	LOS F?			Actual	(apacity	LOS F?
					V _F		4605	Exhibit 13	-8 7200	No
V _{FO}		Exhibit 13-8			$V_{FO} = V_{F}$	- V _R	3397	Exhibit 13	-8 7200	No
					V _R		1208	Exhibit 13-	10 2100	No
Flow Entering	g Merge In	fluence A	lrea		Flow Er	nterin	g Dive	rge Influe	nce Area	
	Actual	Max	Desirable	Violation?		/	Actual	Max Desira	able	Violation?
V _{R12}		Exhibit 13-8			V ₁₂	3	3210	Exhibit 13-8	4400:All	No
Level of Serv	vice Detern	nination (if not F)		Level of	f Serv	vice De	terminatio	on (if not	F)
D _R = 5.475 + 0	.00734 v _R +	0.0078 V ₁₂ ·	- 0.00627 L _A			D _R = 4	1.252 + 0	.0086 V ₁₂ - (0.009 L _D	
D _R = (pc/mi/Ir	ı)				D _R = 30	0.1 (pc	/mi/ln)			
LOS = (Exhibit	13-2)				LOS = D	(Exhil	oit 13-2)			
Speed Determination					Speed L	Deter	minatio	n		
M _s = (Exibit 1	3-11)				D _s = 0.	407 (E	xhibit 13-	12)		
S _R = mph (Ext	, nibit 13-11)				S _R = 58	8.6 mph	(Exhibit	13-12)		
$S_0 = mph (Ext)$, nibit 13-11)				S ₀ = 75	5.2 mph	(Exhibit	13-12)		
S = mph (Exh	, nibit 13-13)				S = 62	2.8 mph	(Exhibit	13-13)		
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	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	AECOM AM		Highway/Direction of Travel From/To Jurisdiction Analysis Year	l-95 SB Seg 5-Be 2020 Bu	et Off & On Ramps ild 2
Project Description SW 10t	h Street SIMR			2020 24	
✓ Oper.(LOS))		Des.(N)	Pla	nning Data
Flow Inputs					-
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D	3210	veh/h veh/day veh/h	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade % Length	0.95 3 0 Level mi	
		ven/m	Up/Down %	1111	
Calculate Flow Adjustr	nents		_		
f _p Ε _T	1.00 1.5		E _R f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	1.2 0.985	
Speed Inputs			Calc Speed Adj and FFS	6	
Lane Width Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured) Base free-flow Speed, BFFS	3 70.0	ft ft ramps/mi mph mph	f _{∟w} f _{LC} TRD Adjustment FFS	70.0	mph mph mph mph
LOS and Performance	Measures		Design (N)		
<u>Operational (LOS)</u> v _p = (V or DDHV) / (PHF x N S D = v _p / S LOS	x f _{HV} x f _p) 1143 70.0 16.3 B	pc/h/ln mph pc/mi/ln	<u>Design (N)</u> Design LOS v _p = (V or DDHV) / (PHF x N x S D = v _p / S Required Number of Lanes, N	f _{HV} x f _p)	pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base free	speed ee-flow speed	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-	-13 2, 11-3	f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

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RAMPS AND RAMP JUNCTIONS WORKSHEET											
Genera	al Infor	mation			Site Infor	mation					
Analyst Agency or Date Perfol	Company rmed	AEC	ОМ	Fra Ju Ju	eeway/Dir of Tranction risdiction	avel	I-95 S Seg 6	B -Merge from	n Hillsboro E&W		
Analysis Ti	ime Period	AM		An	alysis Year		2020	Build 2			
Project Des	scription	SW 10th Stree	et SIMR								
inputs			L								
Upstream /	Adj Ramp		Freeway Num Ramp Numbe	iber of Lanes, N r of Lanes, N	3 1					Downstrea Ramp	ım Adj
✓ Yes	🗌 On		Acceleration L	ane Length, L _A	300					🗌 Yes	On
🗌 No	✓ Off	:	Deceleration I Freeway Volu	₋ane Length L _D me, V _⊏	3210					🗹 No	Off
L _{up} =	2400	ft	Ramp Volume	e, V _R	1290					L _{down} =	ft
$V_u = 1100 \text{ veh/h}$ Ramp Free-Flow Speed, S_{FF} 70.0 V _D = V _D =					V _D =	veh/h					
Conversion to pc/h Under Base Conditions											
(pc	:/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv		f _{HV}	f _p	v = V/PHF	x f _{HV} x f _p
Freeway		3210	0.95	Level	3	0	0).985	1.00	34	130
Ramp		1290	0.92	Level	2	0	0).990	1.00	14	116
UpStream		1100	0.92	Level	2	0	0).990	1.00	12	208
DownStrea	Stream										
			Merge Areas		-	Diverge Areas					
Estimation of v ₁₂ Estimation of v ₁₂											
		V ₁₂ = V _F	(P _{EM})					V - 1			
L _{E0} =		1383.24	(Fouation	13-6 or 13-7)		_		v ₁₂ –	v _R + (v _F - v _R) ^P FD	
P=		0.586	using Equat	ion (Exhibit 13-6)		L _{EQ} =			(Equation 13-	12 or 13-13	3)
		2010	nc/h			P _{FD} =		I	using Equatio	on (Exhibit 13	-7)
* 12		1/20	pc/h pc/h (Equati	on 13-11 or 13-		V ₁₂ =		I	pc/h		
V ₃ or V _{av34}	> 2 70	17)		01110-14-01-10-		V ₃ or V _{av34} Is V ₃ or V _{av}	₂₄ > 2,	700 pc/h? [pc/h (Equation 1 □Yes □No	3-14 or 13-17	7)
	$x_{34} \sim 2,70$					Is V ₂ or V	، ب > 1.	5 * V.,/2			
If Yes,V _{12a}	av34 ~ 1.5	v ₁₂ /2 ⊻ Ye 2010	s No pc/h (Equati	on 13-16, 13-		lf Yes,V _{12a} =	=	- ₁₂- ∟ 1;	pc/h (Equation 3-19)	n 13-16, 13	-18, or
Canaai	the Cha	18, or	13-19)			Canaait	V Ch	aaka	/		
Capaci	ty Che	CNS Actual		`anasitu		Lapach	y Ch	Actual	Car	o oitr	
<u> </u>		Actual		apacity	LUS F?	V		Actual			LUSF?
V		4846	Exhibit 13-8		No	$V_{FO} = V_{F}$	- V _R		Exhibit 13-6	8	
	-0	1010				V _R			Exhibit 13- 10	-	
Flow E	nterind	Merge In	fluence A	rea		Flow En	nterii	ng Dive	rge Influen	ce Area	•
		Actual	Max	Desirable	Violation?			Actual	Max Desi	irable	Violation?
V _R	12	3426	Exhibit 13-8	4600:All	No	V ₁₂			Exhibit 13-8		
Level o	of Serv	ice Deterr	nination (if not F)	1	Level of	f Ser	vice De	terminatio	n (if not	F)
Dn	= 5.475 +	0.00734 v _D + (0.0078 V ₄₀ - 0.	00627 L			D _D =	4.252 + 0	.0086 V ₄₀ - 0.	.009 Lp	,
$D_{-} = 2$	29 7 (nc/m	i/In)	12	A		$D_{-} = (r$	R nc/mi/	(ln)	12	D	
	D (Evhibit ·	13.2)				-R (F	Sc/IIII/ Svbibi	11) i+ 12 2)			
		15-2)				LUS - (L		11 13-2)			
speed	Detern	ination				speea L	Jetel		חו		
M _S = (0.411 (Exik	oit 13-11)				υ _s = (Ε	xhibit	13-12)			
S _R = 5	58.5 mph (Exhibit 13-11)				S _R = m	ph (Ex	hibit 13-12)			
S ₀ = 6	66.7 mph (Exhibit 13-11)				S ₀ = m	ph (Ex	hibit 13-12)			
S = 6	60.7 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	I-95 SB Seg 7-B	et On Ramps
Analysis Time Period	AM		Analysis Year	2020 Bu	iild 2
Project Description SW 10th	h Street SIMR				
✓ Oper.(LOS)			Des.(N)		anning Data
Volume, V AADT	4500	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T	0.95 3	
Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	%Rvs, P _R General Terrain: Grade % Length Up/Down %	0 Level mi	
Calculate Flow Adjustr	nents				
f _p	1.00		E _R	1.2	
Έ _Τ	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
Speed Inputs			Calc Speed Adj and FFS	6	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f _{LW}		mph
Number of Lanes, N	3		f _{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			
LOS and Performance	Measures		Design (N)		
<u>Operational (LOS)</u> v _p = (V or DDHV) / (PHF x N : S D = v _p / S LOS	x f _{HV} x f _p) 1603 68.1 23.5 C	pc/h/ln mph pc/mi/ln	<u>Design (N)</u> Design LOS v _p = (V or DDHV) / (PHF x N x S D = v _p / S Required Number of Lanes, N	f _{HV} x f _p)	pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base free our volume	speed ee-flow speed	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2	-13 2, 11-3	f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

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Job: SW 10th Street SIMR Analyst: AECOM

L	ocation:	Seg 8: I-	95 South	bound On-Ram	p from SW 1	0th Street E	EB & WB
Α	nalysis Period:	AM Peak	Hour				
Α	nalysis Year:	2020 Bui	d 2				- -
4,500 —				▶ 5,460			
							\rightarrow
960							-
			0.05				
			0.95	In			
		v _{fr} –	5,460	vpn			
		v _r =	960	vph			
		v _f =	4,500				
Up	ostream Freeway	Tr % =	3%				
	Ramp	Tr % =	2%				
Dow	nstream Freeway	Tr % =	3%				
	Freeway	f _{HV} =	1/(1+P₁	r(E _T -1)+P _R (E _R -	1)) =	0.985	
	Ramp	f _{HV} =	1/(1+P ₁	r(E _T -1)+P _R (E _R -	1)) =	0.9901	
	flat terrain	Ε _τ =	1.5				
		RV % =	0				
Drive	er Population adj.	f _P =	1.000				
		V _{fr} =	=v _{fr} /(PH	$IF)(f_{HV})(f_{P}) =$	5,834	pc/h	
		V _r =	=v _r /(PH	$F)(f_{HV})(f_{P}) =$	1,021	pc/h	
		V _f =	=v _f /(PH	$F)(f_{HV})(f_{P}) =$	4,808	pc/h	
No. lan	es upstream of ramp	N =	3				

<u>No. Ln</u>	Capacity Check (see Exhibits 25-3 and 25-7):	Maximum	Actual	V/c	LOS F?
4	Fwy downstream of ramp (assume 70 mph free-flow speed) =	9,600	5,834	0.61	No
3	Fwy upstream of ramp (assume 70 mph free-flow speed) =	7,200	4,808	0.67	No
1	Capacity on On-Ramp (assume 45 mph free-flow speed) =	2,100	1,021	0.49	No

	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	AM		Analysis Year	2020 Bu	11a 2
					unning Data
Flow Inputs			Des.(III)		
Volume, V AADT	5460	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T	0.95 3	
Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	%RVs, P _R General Terrain: Grade % Length Up/Down %	0 Level mi	
Calculate Flow Adjustr	nents				
f _p E _T	1.00 1.5		E _R f _{HV/} = 1/[1+P _T (E _T - 1) + P _P (E _P - 1)]	1.2 0.985	
Speed Inputs			Calc Speed Adi and FFS	5	
Lane Width Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured) Base free-flow Speed, BFFS	4 70.0	ft ft ramps/mi mph mph	f _{LW} f _{LC} TRD Adjustment FFS	70.0	mph mph mph mph
LOS and Performance	Measures		Design (N)		
<u>Operational (LOS)</u> v _p = (V or DDHV) / (PHF x N S D = v _p / S LOS	x f _{HV} x f _p) 1458 69.2 21.1 C	pc/h/ln mph pc/mi/ln	<u>Design (N)</u> Design LOS v _p = (V or DDHV) / (PHF x N x S D = v _p / S Required Number of Lanes, N	f _{HV} x f _p)	pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base free our volume	speed ee-flow speed	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-	-13 2, 11-3	f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

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RAMPS AND RAMP JUNCTIONS WORKSHEET

	RAI	MPS AND	RAMP JUNC	CTIONS W	ORKSHE	EET					
General Infor	mation			Site Infor	mation						
Analyst			Fre	eway/Dir of Tra	avel	I-95 SB					
Agency or Company	AECO	MC	Ju	nction	:	Seg 10-	Merge fro	m Ex to GP			
Date Performed			Ju	risdiction							
Analysis Time Period	MA k		An	alysis Year		2020 Bu	uild 2				
Project Description	SW 10th Stree	t SIMR									
Inputs											
I Instream Adi Ramp		Freeway Num	ber of Lanes, N	4					Downstrea	am Adi	
opstream naj ramp		Ramp Numbe	r of Lanes, N	1					Ramp	in / oj	
Yes Or	ı	Acceleration I	ane Length I	600							
		Deceleration		000					Yes	On	
No Of	f		Lane Length L _D						🗌 No	✓ Off	
		Freeway Volu	me, V _F	5460					_	4450 6	
L _{up} = ft		Ramp Volume, V _R 270 L _{down} – 1150					1150 π				
		Freeway Free-Flow Speed, S _{FF} 70.0					650 vob/b				
v _u = veh/h		Ramp Free-F	low Speed, S _{ED}	50.0					v _D -	050 Ven/n	
Conversion to	o pc/h Und	der Base	Conditions								
(no/h)	V		Torrain	0/ Truels	0/ D			f		vf vf	
(pc/n)	(Veh/hr)	PHF	Terrain	% I FUCK	%KV		HV	Р	v – v/Pnr	x I _{HV} x I _p	
Freeway	5460	0.95	Level	3	0	0.9	985	1.00	5	834	
Ramp	270	0.92	Level	2	0	0.9	90	1.00	2	296	
UpStream											
DownStream	650	0.92	Level	2	0	0.9	90	1.00	714		
		Merge Areas					0	iverge Areas			
Estimation of	^f v ₁₂				Estimati	ion of	f v ₁₂				
	$V_{40} = V_{F}$	(P _{EM})					., .		<u>, </u>		
=	(Equ:	` ™′ ation 13_6 o	r 13_7)				V ₁₂ = 1	v _R + (v _F - v _R	P _{FD}		
EQ			$(\nabla \cdot \cdot \nabla \cdot \cdot \nabla \cdot \cdot \nabla \cdot \cdot \nabla \cdot \nabla \cdot \nabla \cdot \nabla \cdot$		L _{EQ} =		(Equation 13-	12 or 13-1	3)	
FM -	0.181		tion (Exhibit 13-6)		P _{FD} =		ι	using Equatio	on (Exhibit 13	-7)	
V ₁₂ =	1055	pc/h			V ₁₂ =		F	oc/h			
V_3 or $V_{3\sqrt{34}}$	2389	pc/h (Equati	on 13-14 or 13-		V_2 or V_{av24}			oc/h (Equation 1	3-14 or 13-1	7)	
	17)				Is V ₂ or V ₂)0 pc/h? □			,	
$15 v_3 \text{ or } v_{av34} > 2,70$		s 🗹 No			le V or V	×15	*\/ /2 □				
Is V_3 or $V_{av34} > 1.5$	[•] V ₁₂ /2 ⊻Ye	s 🗌 No			15 v ₃ 01 v _{av3}	34 - 1.5	v ₁₂ ′∠ ∟		n 12 16 13	0 10 or	
If Yes,V _{12a} =	2333	pc/h (Equati	on 13-16, 13-		If Yes,V _{12a} =		13	3-19)	11 13-10, 13	5-10, UI	
	18, or	13-19)			Conceit	· Cha	aka	/			
Capacity Che	CKS	1 .		1 0 0 50	Capacity		CKS				
	Actual		Japacity	LOS F?			Actual	Ca	pacity	LOS F?	
					V _F			Exhibit 13-	8		
V _{FO}	6130	Exhibit 13-8		No	$V_{FO} = V_{F}$	- V _R		Exhibit 13-	8		
ro					V			Exhibit 13	-		
					r R			10			
Flow Entering	g Merge In	fluence A	rea		Flow En	tering	<u>g Dive</u> l	rge Influen	ice Area		
L	Actual	Max	Desirable	Violation?		A	ctual	Max Desi	irable	Violation?	
V _{R12}	2629	Exhibit 13-8	4600:All	No	V ₁₂			Exhibit 13-8			
Level of Serv	ice Detern	nination (if not F)		Level of	Serv	ice De	terminatio	n (if not	F)	
D _R = 5.475 +	0.00734 v _R + 0).0078 V ₁₂ - 0.	00627 L _A		[C	D _R = 4.	.252 + 0	.0086 V ₁₂ - 0	.009 L _D		
D _R = 22.1 (pc/m	ii/ln)				D _R = (n	c/mi/ln	1)		-		
OS = C (Exhibit)	, 13-2)				$ 0\rangle = (F$	vhihit	, 13-2)				
	nination					otor	ninotic	<u></u>			
Speed Detern	mation				Speea D	recern		011			
M _S = 0.315 (Exi	bit 13-11)				u _s = (E:	xhibit 13	3-12)				
$S_R = 61.2 \text{ mph} (Exhibit 13-11)$ $S_R = mph (Exhibit 13-12)$											
$S_0 = 65.5 \text{ mph}$	(Exhibit 13-11)				S ₀ = mp	oh (Exhi	bit 13-12)				
S = 63.6 mph	(Exhibit 13-13)				S = mr	oh (Exhi	bit 13-13)				
<u>ب</u>					I'	· ·	1				

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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 Tr	avel	I-95 SE	}			
Agency or Company	AECO	MC	Ju	nction		Seg 11	- Diverge to	o Express		
Date Performed			Ju	risdiction		•	-			
Analysis Time Perio	d AM		An	alysis Year		2020 B	uild 2			
Project Description	SW 10th Stree	t SIMR								
Inputs		¥								
Upstream Adj F	Ramp	Freeway Num	nber of Lanes, N	4					Downstrea	am Adj
		Ramp Numbe	er of Lanes, N	1					Ramp	,
Yes 🖸	🗹 On	Acceleration I	Lane Length, L							
		Deceleration	lane Length L_	200						
	_] Off	Eroowov Volu		E720					🗹 No	Off
	150 #		ine, v _F	5730					I. =	ft
Lup –	150 11	Ramp Volume	e, V _R	650					down	
V = 27	70 veh/h	Freeway Free	e-Flow Speed, S _{FF}	70.0					V _D =	veh/h
	o ven/n	Ramp Free-F	low Speed, S _{FR}	45.0						
Conversion t	o pc/h Und	der Base	Conditions							
(no/h)	V		Torrain	% Truck	0/ Dv		f	f		vfvf
(рслі)	(Veh/hr)	ГШ	Terrain	/011UCK	70INV		'HV	'p	v – v/i i ii	∧'HV ^'p
Freeway	5730	0.95	Level	3	0	0.	985	1.00	61	22
Ramp	650	0.92	Level	2	0	0.	990	1.00	7	14
UpStream	270	0.92	Level	2	0	0.	990	1.00	2	96
DownStream										
	_	Merge Areas						iverge Areas		
Estimation of	f v ₁₂				Estimat	ion o	of v ₁₂			
	$V_{12} = V_{E}$	(P _{EM})					V ₁₂ =	V _P + (V _F - V		
L _{FO} =	(Equa	tion 13-6 or	13-7)		L _{EO} =		12	Equation 13	-12 or 13-13)
-EQ P =		Equation (Evhibit 13_6		-EQ P =		0.	136 using E	nuation (Evhi	/ hit 13 7)
'FM	using				'FD		0.0	450 using ∟		bit 13-7)
v ₁₂ -	pc/n				v ₁₂ -		30	1/2 pc/n		
v ₃ or v _{av34}	pc/h (Equation 13	3-14 or 13-17)		v ₃ or v _{av34}		15	525 pc/h (Eq	uation 13-14	4 or 13-17)
Is V_3 or $V_{av34} > 2,70$	00 pc/h? 🗌 Ye	s 🗌 No			Is V ₃ or V _{av}	₃₄ > 2,7	00 pc/h?	Yes 🗹 No)	
Is V_3 or $V_{av34} > 1.5$	* V ₁₂ /2 Yes	s 🗌 No			Is V ₃ or V _{av}	₃₄ > 1.5	* V ₁₂ /2	Yes 🗹 No)	
If Yes,V ₁₂₂ =	pc/h (Equation 13	8-16, 13-18, or		If Yes,V ₁₂₀ =	=	р	c/h (Equatio	n 13-16, 13	-18, or 13-
	13-19)						1	9)		
Capacity Cne		1			Capacit	y Cn	ecks			
	Actual		Capacity	LOS F?	<u> </u>		Actual	(apacity	LOS F?
					V _F		6122	Exhibit 13	-8 9600	No
V _{FO}		Exhibit 13-8			$V_{FO} = V_{F}$	- V _R	5408	Exhibit 13	-8 9600	No
					V _R		714	Exhibit 13-	10 2100	No
Flow Enterin	a Merae In	fluence A	rea		Flow En	terin	a Dive	rae Influe	nce Area	8
	Actual	Max	Desirable	Violation?			Actual	Max Desira	able	Violation?
Varia		Exhibit 13-8			Via		3072	Exhibit 13-8	4400·All	No
	l vico Dotorn	nination ((if not E)			<u> </u>	vice De	torminati	n (if not)
					Lever					r)
$D_{R} = 5.475 \pm 0$.00734 V _R + 1	0.0078 v ₁₂	- 0.00627 L _A			$D_R = 2$	1.252 + 0	.0086 v ₁₂ - (0.009 L _D	
D _R = (pc/mi/lr	ו)				D _R = 31	1.5 (pc	/mi/ln)			
LOS = (Exhibit	13-2)				LOS = D	(Exhil	oit 13-2)			
Speed Determination					Speed L	Deter	minatic	on		
M_ = (Exibit 13-11)					D _s = 0.	362 (E	xhibit 13-	·12)		
$S = mnh (Ev)^{1}$					S _p = 50).9 mnh	(Exhibit	, 13-12)		
					S.= 70	5 3 mnh	(Evhibit	13_12)		
$S_0 = mpn (Ext)$	11DIT 13-11)					- o		10-12)		
p = mpn (Exr	iidit 13-13)				5 = 65	o.9 mph	(Exhibit	13-13)		
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	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed	AECOM		Highway/Direction of Travel From/To Jurisdiction	I-95 SB Seg 13-L	Bet Off & On Ramps
Project Description SW 10t	h Street SIMR		Analysis real	2020 Би	
✓ Oper.(LOS)			Des.(N)	Pla	nning Data
Flow Inputs					3
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D	4220	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain:	0.95 3 0 Level	
DDHV = AADT x K x D		ven/h	Grade % Length Up/Down %	mı	
Calculate Flow Adjustr	nents				
f _p	1.00		E _R	1.2	
Ε _T	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
Speed Inputs			Calc Speed Adj and FFS	6	
Lane Width Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured) Base free-flow Speed, BFFS	3 70.0	ft ft ramps/mi mph mph	f _{LW} f _{LC} TRD Adjustment FFS	70.0	mph mph mph mph
LOS and Performance	Measures		Design (N)		
<u>Operational (LOS)</u> v _p = (V or DDHV) / (PHF x N S D = v _p / S LOS	x f _{HV} x f _p) 1503 68.9 21.8 C	pc/h/ln mph pc/mi/ln	<u>Design (N)</u> Design LOS v _p = (V or DDHV) / (PHF x N x S D = v _p / S Required Number of Lanes, N	f _{HV} x f _p)	pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base free our volume	speed ee-flow speed	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2	13 2, 11-3	f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

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		F	REEWA	Y WEAV	ING WOF	RKSHEE	Т			
Genera	al Informati	on			Site Info	rmation				
Analyst Agency/Co Date Perfo Analysis Ti	ompany ormed ime Period	AECOI AM	М		Freeway/Dir Weaving Seg Analysis Yea	Freeway/Dir of Travel I-95 SB Weaving Segment Location Seg 14- Bet Sample & Copans Analysis Year 2020 Build 2				
Project De	scription SW 10t	h Street SIMF	2							
Inputs					1					
Weaving configuration One-Side Weaving number of lanes, N Weaving segment length, L _s Weaving segment length, FFS 70 mp Preeway free-flow speed, FFS 70 mp				One-Sided 4 2520ft 70 mph	Segment type Freew Freeway minimum speed, S _{MIN} 24 Freeway maximum capacity, C _{IFL} 24 Terrain type Letter					
Conve	rsions to p	c/h Unde	r Base Co	ondition	S		r	1		
	V (veh/h)	PHF	Truck (%)	RV (%)	Ε _Τ	E _R	f _{HV}	fp	v (pc/h)	
V _{FF}	3605	0.95	3	0	1.5	1.2	0.985	1.00	3852	
V _{RF}	1780	0.92	2	0	1.5	1.2	0.990	1.00	1954	
V _{FR}	615	0.92	2	0	1.5	1.2	0.990	1.00	675	
V _{RR}	0	0.95	0	0	1.5	1.2	1.000	1.00	0	
V _{NW}	3852		-	-			-	V =	6481	
V _w	2629									
VR	0.406									
Config	uration Cha	aracteris	tics							
Minimum r	maneuver lanes,	N _{WL}		2 lc	Minimum we	aving lane cl	hanges, LC _{MIN}		lc/h	
Interchang	ge density, ID			0.7 int/mi	Weaving lan	e changes, L	.C _w		lc/h	
Minimum I	RF lane changes	, LC _{rf}		1 lc/pc	Non-weaving	g lane chang	es, LC _{NW}		lc/h	
Minimum I	FR lane changes	, LC _{FR}		1 lc/pc	Total lane ch	nanges, LC _{AL}	L		lc/h	
Minimum I	RR lane changes	, LC _{RR}		lc/pc	Non-weaving	g vehicle inde	ex, I _{NW}			
Weavir	ng Segmen	t Speed,	Density,	Level of	Service,	and Cap	oacity			
Weaving s	segment flow rate	, V		6398 veh/h	Weaving inte	ensity factor,	W			
Weaving s	segment capacity	, c _w		5829 veh/h	Weaving seg	gment speed	, S		mph	
Weaving s	segment v/c ratio			1.098	Average wea	aving speed,	S _w		mph	
Weaving s	Weaving segment density, D pc/m					/In Average non-weaving speed, S _{NW}			mph	
Level of S	evel of Service, LOS				F Maximum weaving length, L _{MAX} 6745 ft					
Notes										
a. Weaving Chapter 13	segments longer t	han the calcula	ated maximum le	ength should l	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 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	2020 Bu	iild 2
Project Description SW 10t	n Street SIMR				unning Data
Elow Inpute			Des.(N)		anning Data
	4690	veh/h	Dook Hour Foster, DHF	0.05	
AADT	4000	veh/day	%Trucks and Buses, P _T	0.95 3	
Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	%Rvs, P _R General Terrain: Grade % Length Up/Down %	0 Level mi	
Calculate Flow Adjustr	nents				
f _p	1.00		E _R	1.2	
Έ _Τ	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
Speed Inputs			Calc Speed Adj and FFS	3	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f _{LW}		mph
Number of Lanes, N	4		t _{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			
LOS and Performance	Measures		Design (N)		
<u>Operational (LOS)</u> v _p = (V or DDHV) / (PHF x N S D = v _p / S LOS	x f _{HV} x f _p) 1250 70.0 17.9 B	pc/h/ln mph pc/mi/ln	<u>Design (N)</u> Design LOS v _p = (V or DDHV) / (PHF x N x S D = v _p / S Required Number of Lanes, N	f _{HV} x f _p)	pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base free our volume	speed ee-flow speed	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2	13 2, 11-3	f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

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		F	REEWAY	WEAV	ING WOF	RKSHEE	Т		
Genera	I Information	on			Site Info	rmation			
Analyst Agency/Cor Date Perfor Analysis Tir	Analyst Agency/Company AECOM Date Performed Analysis Time Period PM				Freeway/Dir Weaving Sec Analysis Yea	of Travel gment Locatio	195/S on Seg 2 2020	B 2-Bet On from Build 2	Exp & Off
Project Des	cription SW 10t	h Street SIMF	2						
Inputs					•				
Weaving configurationTwo-SidedWeaving number of lanes, N4Weaving segment length, Ls3900flFreeway free-flow speed, FFS70 mph				Two-Sided 4 3900ft 70 mph	Segment typ Freeway min Freeway ma: Terrain type	e imum speed ximum capac	, S _{MIN} ity, C _{IFL}		Freeway 15 2400 Level
Conver	sions to po	c/h Unde	r Base Co	ndition	S	Ĩ	•	1	
	V (veh/h)	PHF	Truck (%)	RV (%)	E _T	E _R	f _{HV}	fp	v (pc/h)
V _{FF}	3730	0.95	3	0	1.5	1.2	0.985	1.00	3985
V _{RF}	870	0.92	2	0	1.5	1.2	0.990	1.00	955
V _{FR}	950	0.92	2	0	1.5	1.2	0.990	1.00	1043
V _{RR}	100	0.92	2	0	1.5	1.2	0.990	1.00	110
V _{NW}	5983							V =	6093
V _W	110								
VR	0.018								
Configu	iration Cha	aracteris	tics		1				
Minimum m	aneuver lanes, l	N _{WL}		0 lc	Minimum we	eaving lane cl	hanges, LC _{MIN}	1	330 lc/h
Interchange	e density, ID			0.7 int/mi	Weaving lan	e changes, L	.C _W		902 lc/h
Minimum R	F lane changes,	$\mathrm{LC}_{\mathrm{RF}}$		0 lc/pc	Non-weaving lane changes, LC _{NW} 280				
Minimum F	R lane changes,	$\mathrm{LC}_{\mathrm{FR}}$		0 lc/pc	Total lane ch	nanges, LC _{AL}	L		3707 lc/h
Minimum R	R lane changes,	, LC _{RR}		3 lc/pc	Non-weaving	g vehicle inde	ex, I _{NW}		1633
Weavin	g Segment	t Speed,	Density, I	_evel of	Service,	and Cap	oacity		
Weaving segment flow rate, v6014 veh/hWeaving segment capacity, cw8855 veh/h				5014 veh/h 3855 veh/h	Weaving inte Weaving sec	ensity factor, gment speed	W , S		0.217 60.3 mph
Weaving segment v/c ratio 0.6				0.679	9 Average weaving speed, S _w				
Weaving segment density, D 25.3 pc/m					/In Average non-weaving speed, S_{NW} 60.3				60.3 mph
Level of Se	rvice, LUS			С	Maximum weaving length, L _{MAX} 5894 ft				
Notes	ognosta lange 1	han tha asland	tod movimenter !-	nath obaulat	o trooted as !-	alatad man-	and diverse	iooo uoise the	propoduros of
 a. weaving s Chapter 13, b. For volum 	Freeway Merge a	and Diverge Se weaving segi	egments". nent capacity, th	<u>ne level of</u> sei	vice is "F".	solateu merge	and diverge ar	eas using the	sideeuures of

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	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	AECOM		Highway/Direction of Travel From/To Jurisdiction	I-95 SB Seg 3-B	et Off & On Ramp
Project Description SW 10	th Street SIMR			2020 Bu	
✓ Oper.(LOS)		Des.(N)	Pla	anning Data
Flow Inputs	,				5
Volume, V AADT Peak-Hr Prop. of AADT, K Peak Hr Direction Bron. D	4600	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R Conoral Terrain:	0.95 3 0	
DDHV = AADT x K x D		veh/h	General Terrain. Grade % Length Up/Down %	mi	
Calculate Flow Adjust	ments				
f _p Ε _T	1.00 1.5		E _R f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	1.2 0.985	
Speed Inputs			Calc Speed Adj and FFS	6	
Lane Width Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured) Base free-flow Speed, BFFS	3 70.0	ft ft ramps/mi mph mph	f _{∟w} f _{LC} TRD Adjustment FFS	70.0	mph mph mph mph
LOS and Performance	Measures		Design (N)		
<u>Operational (LOS)</u> v _p = (V or DDHV) / (PHF x N S D = v _p / S LOS	x f _{HV} x f _p) 1638 67.8 24.2 C	pc/h/ln mph pc/mi/ln	$\frac{\text{Design (N)}}{\text{Design LOS}}$ $v_p = (V \text{ or DDHV}) / (PHF x N x)$ S $D = v_p / S$ Required Number of Lanes, N	f _{HV} x f _p)	pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design h	S - Speed D - Density FFS - Free-flow BFFS - Base fre our volume	speed ee-flow speed	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2	.13 2, 11-3	f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

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		RAMP	'S AND RAM	P JUNCTI	ONS WC	RKS	HEET			
General Infor	rmation			Site Infor	mation					
Analyst			Fr	eeway/Dir of Tr	avel	I-95 SE	3			
Agency or Company	AEC	MC	Ju	inction		Seg 4-	Diverge to	SW 10th St		
Date Performed			Ju	risdiction		2020 0				
Project Description	SW 10th Stree	t SIMR	AI	alysis i eal		2020 6				
Inputs										
		Freeway Num	ber of Lanes N	3						
Upstream Adj F	lamp	Ramp Numbe	of Lanes N	1					Downstre	am Adj
Yes	On		ano Longth	I						_
		Deceleration	Lane Length, L _A	200					Ves 🗹	🗹 On
I I No □	Off			200					🗌 No	Off
	1	Freeway volu	ime, v _F	4600					. =	2400 ft
L up −	L	Ramp Volume	e, V _R	840					down	2400 10
V = v	eh/h	Freeway Free	e-Flow Speed, S _{FF}	70.0					V _D =	1410 veh/h
		Ramp Free-F	low Speed, S _{FR}	45.0						
Conversion t	o pc/h Un	der Base	Conditions							
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv		f _{HV}	f _p	v = V/PHF	x f _{HV} x f _p
Freeway	4600	0.95	Level	3	0	0.	985	1.00	49	∂ 15
Ramp	840	840 0.92 Level 2			0	0.	990	1.00	9	22
UpStream										
DownStream	1410	0.92	Level	2	0	0.	990	1.00	1	548
	f	Merge Areas			F ation of		<u>[</u>	Diverge Areas		
Estimation of	r v ₁₂				Estimat		^{or v} 12			
	V ₁₂ = V _F	(P _{FM})					V ₁₂ =	• V _R + (V _F - V	/ _R)P _{FD}	
L _{EQ} =	(Equa	ition 13-6 or	13-7)		L _{EQ} =		(Equation 13-	12 or 13-13	3)
P _{FM} =	using	Equation (Exhibit 13-6)		P _{FD} =		0.	595 using Ec	quation (Exh	ibit 13-7)
V ₁₂ =	pc/h				V ₁₂ =		32	297 pc/h		
$V_3^{}$ or $V_{av34}^{}$	pc/h (Equation 13	-14 or 13-17)		$V_3^{}$ or $V_{av34}^{}$		16	618 pc/h (Equ	uation 13-1	4 or 13-17)
Is V_3 or $V_{av34} > 2,70$	00 pc/h? 🗌 Ye	s 🗌 No			Is V_3 or V_{av}	_{/34} > 2,7	'00 pc/h?	Yes 🗹 No		
Is V_3 or $V_{av34} > 1.5$	* V ₁₂ /2	s 🗌 No			Is V_3 or V_{av}	, ₃₄ > 1.5	* V ₁₂ /2	Yes 🗹 No		
If Yes,V _{12a} =	pc/h (Equation 13	-16, 13-18, or		If Yes,V _{12a} =	=	p	c/h (Equation	n 13-16, 13	-18, or 13-
Canacity Che	10-19)				Canacit	v Ch	ocks	9)		
	Actual		Capacity	LOS F?		<u>y en</u>	Actual	С	apacity	LOS F?
					V_		4915	Exhibit 13-	-8 7200	No
V-a		Exhibit 13-8			$V_{} = V_{}$	- V_	3003	Exhibit 13.	-8 7200	No
FO					V	- 'R	022	Exhibit 13	10 2100	No
Elever Enderin		<u></u>					922		2100	NU
Flow Entering	g werge in	Max	Area Dosirablo	Violation?	FIOW Er	Terin	Actual	Max Dosira	ice Area	Violation?
V	Actual	Evhibit 13-8	Desilable	violation	V	+	2007	Evhibit 13-8		No
	l vico Dotorr	nination ((if not E)			fSor		torminatic	n (if not	<u> </u>
$D = 5.475 \pm 0$	00734 v +		0.006271		Leveror		1 252 + 0			.,
$D_R = 0.470 + 0$.00704 V R '	0.0070 12	- 0.00027 L _A		D - 2	$D_R = -$	f.202 · 0	.0000 • 12 - 0		
$B_{\rm R}$ (pc/m/m)					$D_R = 3$	0.6 (pc	//////)			
	LOS - (Exhibit 13-2)						olt 13-2)			
Speed Determination					Speed L	Deter	minatic	<u>on</u>		
M _S = (Exibit 1	M _S = (Exibit 13-11)					.381 (E	xnidit 13-	-12)		
S _R = mph (Exh	nibit 13-11)				S _R = 59	9.3 mph	(Exhibit	13-12)		
S ₀ = mph (Exh	nibit 13-11)				$S_0 = 74$	4.4 mph	(Exhibit	13-12)		
S = mph (Ext	nibit 13-13)				S = 63	3.6 mph	(Exhibit	13-13)		
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	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	AECOM PM		Highway/Direction of Travel From/To Jurisdiction Analysis Year	I-95 SB Seg 5-B 2020 Bu	et Off & On Ramps ild 2
Project Description SW 10	th Street SIMR			2020 Du	
✓ Oper.(LOS))		Des.(N)	Pla	nning Data
Flow Inputs	, 				0
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D	3760	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain:	0.95 3 0 Level	
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	mi	
Calculate Flow Adjust	ments				
f _p E _T	1.00 1.5		E _R f _{1 N/} = 1/[1+P ₇ (E ₇ - 1) + P ₀ (E ₈ - 1)]	1.2 0.985	
Speed Inputs	-		Calc Speed Adi and FES	3	
Lane Width		ft		,	
Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured) Base free-flow Speed, BFFS	3 70.0	ft ramps/mi mph mph	f _{∟w} f _{LC} TRD Adjustment FFS	70.0	mph mph mph mph
LOS and Performance	Measures		Design (N)		
<u>Operational (LOS)</u> v _p = (V or DDHV) / (PHF x N S D = v _p / S LOS	x f _{HV} x f _p) 1339 69.8 19.2 C	pc/h/ln mph pc/mi/ln	Design (N) Design LOS v _p = (V or DDHV) / (PHF x N x S D = v _p / S Required Number of Lanes, N	f _{HV} x f _p)	pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design he	S - Speed D - Density FFS - Free-flow BFFS - Base fre our volume	speed ee-flow speed	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2	13 2, 11-3	f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

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	RA	MPS AND	RAMP JUN	CTIONS W	ORKSH	EET				
General Infe	Site Infor	mation								
Analyst Agency or Compa	ny AEC	ОМ	Fr Ju	eeway/Dir of Tra Inction	avel	I-95 S Seg 6	B -Merge from	n Hillsboro E&W		
Date Performed Analysis Time Per	iod PM		Ju Ar	nsulction alvsis Year		20201	Build 2			
Project Description	n SW 10th Stree	t SIMR	7.0			20201				
Inputs										
		Freeway Num	ber of Lanes, N	3						A .!!
Upstream Adj Rar	np	Ramp Numbe	r of Lanes, N	1					Downstrea Ramp	m Adj
Yes	Un	Acceleration L	300					🗌 Yes	🗌 On	
No 🔽	Off	Freeway Volu	3760					🗹 No	Off	
L _{up} = 2400) ft	Ramp Volume	e, V _R	1410					L _{down} =	ft
V _u = 840	veh/h	Freeway Free Ramp Free-Fl	-Flow Speed, S _{FF}	70.0 50.0					V _D =	veh/h
Conversion	to pc/h Un	der Base	Conditions							
(pc/h)	V	PHF	Terrain	%Truck	%Rv		f	f	v = V/PHF	x f _{uv} x f _n
Freeway	(Veh/hr) 3760	0.95	l evel	3	0		⊓v) 985	p 1 00	40	нv р 17
Ramp	1410	0.92	Level	2	0) 990	1.00	15	48
UpStream	840	0.92	Level	2	0).990	1.00	9:	22
DownStream										
Merge Areas Diverge Areas										
Estimation		Estimat	tion o	of v ₁₂						
	V ₁₂ = V _F	(P _{FM})					V ₁₂ = '	Vp + (Vr - Vp)P _{ED}	
L _{EQ} =	1537.11	l (Equation	13-6 or 13-7)		L _{EO} =		12	Equation 13-	12 or 13-13	5)
P _{FM} =	0.586	using Equat	ion (Exhibit 13-6)	1			l	using Equatio	n (Exhibit 13-	, 7)
V ₁₂ =	2354	pc/h			$V_{12} =$			oc/h	,	'
$V_3^{}$ or $V_{av34}^{}$	1663 17)	pc/h (Equati	on 13-14 or 13-		V_3^{12} or V_{av34}^{12}			pc/h (Equation 1	3-14 or 13-17)
Is V_3 or $V_{av34} > 2$,700 pc/h? 🗌 Ye	s 🗹 No			Is V ₃ or V _{av}	_{/34} > 2,	700 pc/h?	Yes No		
Is V_3 or $V_{av34} > 1$.5 * V ₁₂ /2 🗹 Ye	s 🗌 No			Is V ₃ or V _{av}	₃₄ > 1.	5 * V ₁₂ /2	Yes No		10
If Yes,V _{12a} =	2354 18. or	pc/h (Equati	on 13-16, 13-		lf Yes,V _{12a} =	=	 1:	oc/h (Equatio 3-19)	n 13-16, 13	-18, or
Capacity Cl	hecks	10-19)			Capacit	y Ch	necks			
	Actual	C	apacity	LOS F?	<u> </u>		Actual	Car	pacity	LOS F?
					V _F			Exhibit 13-8	8	
V _{FO}	5565	Exhibit 13-8		No	V _{FO} = V _F	- V _R		Exhibit 13-8	8	
					V _R			Exhibit 13- 10	-	
Flow Enteri	ng Merge In	fluence A	rea		Flow Er	nterii	ng Dive	rge Influen	ce Area	
	Actual	Max	Desirable	Violation?		+	Actual	Max Desi	rable	Violation?
	3902	Exhibit 13-8	4600:All	NO	V ₁₂		nico Do	Exhibit 13-8	n (if not i	-)
Level of Sel					Levero	r Ser				7
$D_R = 5.475 \pm 0.00734 V_R \pm 0.0076 V_{12} = 0.00627 L_A$						U _R -	4.252 + U " 、	.0000 v ₁₂ - 0.	.009 L _D	
D _R – 33.3 (ро 109 – D (Бурі	///////) hit 12:0)				$\nu_{\rm R} = (r$	⊃C/MI/ =vhihi	'IN) it 12 2)			
Speed Determination							rminatic	<u>n</u>		
M = 0.494 //					$D_{a} = (F_{a})$		13-12)	// 1		
$S_{-} = 56.4 \text{ mm}$	$\frac{1}{1000} = \frac{1000}{1000} =$				s (⊑ S _□ = m	nph (Ex	(hibit 13-12)			
S.= 650mm	$\frac{ }{ } = \frac{ }{ } = \frac{ }{ } = \frac{ }{ $				S ₀ = m	nph (Fx	(hibit 13-12)			
S = 59.0 mm	bh (Exhibit 13-13)				S = m	nph (Ex	(hibit 13-13)			
ļ'	,				I	`	,			

	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed	AECOM		Highway/Direction of Travel From/To Jurisdiction	I-95 SB Seg 7-B	et On Ramps
Analysis Time Period	PM		Analysis Year	2020 Bu	1110 Z
Oper (LOS)			Des (N)	Pla	anning Data
Flow Inputs	,		200.(11)		
Volume, V AADT	5170	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T	0.95 3	
Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	%RVs, P _R General Terrain: Grade % Length Up/Down %	0 Level mi	
Calculate Flow Adjustr	ments				
f _p	1.00		E _R	1.2	
E _T	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
Speed Inputs			Calc Speed Adj and FFS	6	
Lane Width Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured) Base free-flow Speed, BFFS	3 70.0	ft ft ramps/mi mph mph	f _{Lw} f _{LC} TRD Adjustment FFS	70.0	mph mph mph mph
LOS and Performance	Measures		Design (N)		
<u>Operational (LOS)</u> v _p = (V or DDHV) / (PHF x N S D = v _p / S LOS	x f _{HV} x f _p) 1841 65.2 28.2 D	pc/h/ln mph pc/mi/ln	Design (N) Design LOS v _p = (V or DDHV) / (PHF x N x S D = v _p / S Required Number of Lanes, N	f _{HV} x f _p)	pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base free our volume	speed ee-flow speed	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2	-13 2, 11-3	f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

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Job: SW 10th Street SIMR Analyst: AECOM

Location:	Seg 8: I-	Seg 8: I-95 Southbound On-Ramp from SW 10th Street EB & PM Peak Hour								
Analysis Year:	2020 Buil	d 2								
		~ _								
5,170			→ 6,220							
1,050										
	PHF =	0.95								
	v _{fr} =	6,220	vph							
	v _r =	1,050	vph							
	v _f =	5,170								
Upstream Freeway	Tr % =	3%								
Ramp	Tr % =	2%								
Downstream Freeway	Tr % =	3%	/ _ / _ / _							
Freeway	f _{HV} =	1/(1+P ₁	r(E _T -1)+P _R (E _R -	1)) =	0.985					
Ramp	f _{HV} =	1/(1+P₁	r(E _T -1)+P _R (E _R -	1)) =	0.9901					
flat terrain	Ε _τ =	1.5								
	RV % =	0								
Driver Population adj.	f _P =	1.000								
	V _{fr} =	=v _{fr} /(PH	$IF)(f_{HV})(f_{P}) =$	6,646	pc/h					
	V _r =	=v _r /(PH	$ F)(f_{HV})(f_{P}) =$	1,116	pc/h					
	V _f =	=v _f /(PH	$F)(f_{HV})(f_{P}) =$	5,524	pc/h					
No. lanes upstream of ramp	N =	3								

<u>No. Ln</u>	Capacity Check (see Exhibits 25-3 and 25-7):	Maximum	Actual	V/c	LOS F?
4	Fwy downstream of ramp (assume 70 mph free-flow speed) =	9,600	6,646	0.69	No
3	Fwy upstream of ramp (assume 70 mph free-flow speed) =	7,200	5,524	0.77	No
1	Capacity on On-Ramp (assume 45 mph free-flow speed) =	2,100	1,116	0.53	No

	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed	AECOM		Highway/Direction of Travel From/To Jurisdiction	I-95 SB Seg 9-B	et 10th & Exit to Exp
Project Description SW 10	th Street SIMR			2020 Bu	
✓ Oper.(LOS)		Des.(N)	Pla	nning Data
Flow Inputs	/		()		
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop. D	6220	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain:	0.95 3 0	
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	mi	
Calculate Flow Adjust	ments				
f _ρ Ε _Τ	1.00 1.5		E _R f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	1.2 0.985	
Speed Inputs			Calc Speed Adj and FFS	6	
Lane Width Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured) Base free-flow Speed, BFFS	4 70.0	ft ft ramps/mi mph mph	f _{LW} f _{LC} TRD Adjustment FFS	70.0	mph mph mph mph
LOS and Performance	Measures		Design (N)		
<u>Operational (LOS)</u> v _p = (V or DDHV) / (PHF x N S D = v _p / S LOS	x f _{HV} x f _p) 1661 67.5 24.6 C	pc/h/ln mph pc/mi/ln	$\frac{\text{Design (N)}}{\text{Design LOS}}$ $v_p = (V \text{ or DDHV}) / (PHF x N x)$ S $D = v_p / S$ Required Number of Lanes, N	f _{HV} x f _p)	pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design he	S - Speed D - Density FFS - Free-flow BFFS - Base fre our volume	speed ee-flow speed	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2	.13 2, 11-3	f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

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	RAI	MPS AND	RAMP JUN	CTIONS W	ORKSH	EET				
General Infor	rmation			Site Infor	mation					
Analyst			Fr	eeway/Dir of Tr	ravel I-95 SB					
Agency or Company	AEC	ОМ	Ju	Inction	Seg 10-Merge from Ex to GP					
Date Performed			Ju	irisdiction		Ū	Ū			
Analysis Time Perio	d PM		Ar	nalysis Year		2020	Build 2			
Project Description	SW 10th Stree	t SIMR								
Inputs										
LInstream Adi Ramn		Freeway Num	ber of Lanes, N	4					Downstre	am Adi
		Ramp Numbe	r of Lanes, N	1					Ramp	
Yes Or	า	Acceleration I	ane Length L	600						
		Personante i Lano Longth, L _A 0000 IV Yes □ On					□ On			
🗹 No 📃 Of	f								🗌 No	✓ Off
		Freeway Volume, V _F 6220					1150 8			
$L_{up} = ft$		Ramp Volume	e, V _R	190					└down ─	1150 11
		Freeway Free	-Flow Speed, S _{FF}	70.0					V_ =	700 veh/h
v _u – ven/r	1	Ramp Free-Fl	ow Speed, S _{FR}	50.0					* D	700 Venini
Conversion t	o pc/h Und	der Base	Conditions							
(nc/h)	V	PHF	Terrain	%Truck	%Rv		f	f	v = V/PHF	x fx f
(poin)	(Veh/hr)			,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		·HV	·p		ну к тр
Freeway	6220	0.95	Level	3	0).985	1.00	6	646
Ramp	190	0.92	Level	2	0).990	1.00	2	209
UpStream Davum Otras and	700	0.00					000	4.00		200
DownStream	700	0.92	Level	2	0	().990	1.00		68
Merge Areas						ion		liverge Areas		
	v 12				LStillat		12			
	V ₁₂ = V _F	(P _{FM})					V ₁₂ =	Vp + (Vr - Vp)P _{ED}	
L _{EQ} =	(Equa	ation 13-6 o	r 13-7)		=		12	(Equation 13-	/ FD 12 or 13_1	3)
P _{FM} =	0.192	using Equat	tion (Exhibit 13-6)	1	P =			using Equation	n (Evhibit 13	-7)
V ₁₂ =	1274	pc/h			FD					-1)
	2686	pc/h (Equati	on 13-14 or 13-		v ₁₂ –					
v ₃ or v _{av34}	17)				v ₃ or v _{av34}	_		pc/h (Equation 1	3-14 or 13-1	()
Is V_3 or $V_{av34} > 2,70$	0 pc/h? 🗌 Ye	s 🗹 No			Is V ₃ or V _{av}	₃₄ > 2,	700 pc/h?	_Yes ∟No		
Is V_3 or $V_{av34} > 1.5$	* V ₁₂ /2 Ve	s 🗌 No			Is V ₃ or V _{av}	₃₄ > 1.	5 * V ₁₂ /2	Yes 🗌 No		
	2658	pc/h (Equati	on 13-16, 13-		If Yes,V _{12a} =	=	1	pc/h (Equatio	n 13-16, 13	8-18, or
11 103, v _{12a} -	18, or	13-19)			120		1.	3-19)		
Capacity Che	ecks				Capacit	y Ch	necks			
	Actual	C	Capacity	LOS F?			Actual	Car	pacity	LOS F?
					V _F			Exhibit 13-8	3	
V=o	6855	Exhibit 13-8		No	$V_{FO} = V_{F}$	-V _R		Exhibit 13-8	3	
FO					<u> </u>			Exhibit 13-		
					۷R			10		
Flow Entering	g Merge In	fluence A	rea		Flow En	iterii	ng Dive	rge Influen	ce Area	
	Actual	Max	Desirable	Violation?			Actual	Max Desi	rable	Violation?
V _{R12}	2867	Exhibit 13-8	4600:All	No	V ₁₂			Exhibit 13-8		
Level of Serv	rice Detern	nination (if not F)		Level of	f Ser	vice De	terminatio	n (if not	F)
D _R = 5.475 +	0.00734 v _R + 0	0.0078 V ₁₂ - 0.	00627 L _A			D _R =	4.252 + 0	.0086 V ₁₂ - 0.	009 L _D	
D _R = 24.0 (pc/m	ni/ln)				D _R = (p	oc/mi/	′ln)			
LOS = C (Exhibit	13-2)				I OS = (E	Exhibi	, it 13-2)			
Speed Deter	nination				Speed [Dete	rminatio	<i>n</i>		
w _s = 0.330 (Exi	dit 13-11)				⊂s (⊏ S -		10^{-12}			
$S_R = 60.8 \text{ mph}$	(Exhibit 13-11)				o _R - m	ihii (⊑x	1011 13-12)			
S ₀ = 64.6 mph	(Exhibit 13-11)				S₀= m	ph (Ex	(nibit 13-12)			
S = 63.0 mph	(Exhibit 13-13)				S= m	ph (Ex	(hibit 13-13)			

Site Information Site Information Appropriate Finance/OPT Travel 145 SB Appropriate Seg 11- Diverge to Express Dependence Seg 11- Diverge to Express Display Display Project Description SW 10th Street SIMR Imputs Downstream Adj Upstream Adj Ramp Freeway Number of Lanes, N 4 Ramp Number of Lanes, N 1 Prese Upstream Adj Ramp Freeway Number of Lanes, N 4 Question and Langib, L _x Downstream Adj Decentration Lane Langib, L _x 200 V _a = 190 veh/h Ramp Volume, V _x 6410 V _a = 190 veh/h Ramp Pole V _b = V _b Ramp V _b = V _b 100 6849 Ramp Upstream 30 0.920 1.00 768 Upstream 190 0.92 Level 2 0 0.990 1.00 768 Brand 0.92 Level 2		RAMPS AND RAMP JUNCTIONS WORKSHEET									
Analyst Freeway/Dir of Travel 145 SB Agency of Compare lot Express Junction Appendy of Compare lot Express Junction Seg 11- Diverge lot Express Seg 11- Diverge lot Express Junction Analysis Time Priod PM Analysis Year 2020 Build 2 Project Description SW 10th Street SIMR Downstream Adj Ramp Analysis Year Upsteam Adj Ramp Freeway Volume V ₁ 0 On Ownstream Adj Ramp Analysis Year Upsteam Adj Ramp Freeway Volume, V ₂ 6410 Image Ownstream Adj Ramp Image No Orff Deceleration Lave Length L ₂ 200 Image Image Image V ₁₁ = 190 Vehth Freeway Volume, V ₂ 6410 Image	General Infor	rmation			Site Infor	mation					
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Analyst			Fre	eeway/Dir of Tr	avel	I-95 SE	}			
Date Performed Jundication Analysis Time Project Description SW 10th Street SIMR 2020 Build 2 Imputs Project Description SW 10th Street SIMR Downstream Adj Imputs Prevent Values, N 1 Acceleration Lane Length L ₀ Downstream Adj Imputs Prevent Values, V _k 6410 Imputs Imputs Imputs Prevent Values, V _k 700 Imputs Imputs Imputs Prevent Yours, V _k 700 Imputs Imputs Imputs Imputs Prevent Yours, V _k 700 Imputs Imputs Imputs Imputs Imputs Prevent Yours, V _k 700 Imputs Imputs<	Agency or Company	AECO	MC	Ju	nction		Seg 11	- Diverge to	o Express		
Analysis Time Period PM Analysis Year 2020 Build 2 Hopelat Description SW (bh) Steter SIMR Hopelat Description Lane Lengh, L _A \square Ves \square On \square Orf Freeway Number of Lanes, N 1 \square Ves \square On \square Deceleration Lane Lengh, L _A \square Acceleration Lane Lengh, L _A \square Ves \square On \square Deceleration Lane Lengh, L _A \square Ves \square On \square Deceleration Lane Lengh, L _A \square Ves \square On \square Pression Speed, Sec \square Transing Free-Two Speed, Sec \square Transing Free-Two Speed, Sec \square Transing Free-Two Speed, Sec \square Output Pression Speed, Sec \square Speed Determination of V12 \square Pression to pc/h Under Base Conditions \square (pch) \square Visting Free-Two Speed, Sec \square Transing Free-Two Speed, Sec \square Output Pression Speed Determination (<i>H</i> Output Pre	Date Performed			Ju	risdiction		•	-			
Project Description SW 10th Street SIMR Upstream Adj Ramp Freeway Number of Lanes, N 4 Downstream Adj Ramp Downstream Adj	Analysis Time Perio	d PM		An	alysis Year		2020 B	uild 2			
Imputs Freeway Number of Lanes, N 4 Downstream Adj Ramp Downstream Adj Ramp □ Yes On Acceleration Lane Length, L _h □ Yes On □ No Off Deceleration Lane Length, L _h □ Yes On □ No Off Deceleration Lane Length, L _h □ Yes On V _u = 190 veh/h Ramp Volume, V _x 700 □ V _a V _u = 190 veh/h Ramp Tree-Flow Speed, S _{PT} 70.0 □ V _a □ V _a □ V _a □ V _a v = VIPHF X f _{hrv} X f _p Preversy 6410 0.95 Level 2 0 0.990 1.00 688 UpSteam 190 0.92 Level 2 0 0.990 1.00 208 DownSteam 190 0.92 Level 2 0 0.990 1.00 208 DownSteam 190 0.92 Level 2 0 0.990 1.00 209 DownSteam 190 0.92	Project Description	SW 10th Stree	t SIMR								
Upsteam Adj RampFreeway Number of Lanes, N4Downstream Adj Ramp \square Yes \square Acceleration Lane Length, La Acceleration Lane Length, La Mamp Volume, Va Freeway Volume, Va a man Volume, Va Ramp Free-Flow Speed, Srg Ramp Volume, Va Ramp Free-Flow Speed, Srg Ramp Fre	Inputs										
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Upstream Adj R	Ramp	Freeway Nun	nber of Lanes, N	4					Downstrea	am Adj
			Ramp Numbe	er of Lanes, N	1					Ramp	,
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Yes 🖸	🗹 On	Acceleration	Lane Length, L							
$ \begin{array}{ c c c c c } \hline \begin{tabular}{ c c c c c } \hline \begin{tabular}{ c c c c c c c } \hline \begin{tabular}{ c c c c c c c c c c c c c c c c c c c$		Deceleration Lane Length L 200									
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	No L	_] Off	Erooway Volu		£00 6410					🗹 No	Off
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	1 - 11	150 ft		ine, v _F	0410					I. =	ft
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $		150 11	Ramp Volum	e, v _R	700					down	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	V = 10	0 veh/h	Freeway Free	e-Flow Speed, S _{FF}	70.0					V _D =	veh/h
			Ramp Free-F	low Speed, S _{FR}	45.0						
$ \begin{array}{ c c c c } \hline (pch) & V \\ (Vehhr) & PHF & Terrain & \% Truck & \% Rv & f_{HV} & f_p & V = V/PHF x f_{HV} x f_p \\ \hline Freeway & 6410 & 0.95 & Level & 3 & 0 & 0.965 & 1.00 & 6849 \\ \hline Ramp & 700 & 0.92 & Level & 2 & 0 & 0.990 & 1.00 & 768 \\ \hline UgStream & 190 & 0.92 & Level & 2 & 0 & 0.990 & 1.00 & 209 \\ \hline DownStream & 10 & 0.92 & Level & 2 & 0 & 0.990 & 1.00 & 209 \\ \hline DownStream & 10 & V_{12} & \hline V_{12} = V_p (P_{FM}) & V_{12} = V_p (P_{FM}) \\ \hline V_{12} = V_p (P_{FM}) & V_{12} = V_p + (V_p - V_p) P_{FD} \\ \hline V_{12} = (Equation 13-6 \text{ or } 13-7) \\ \hline P_{PM} = & using Equation (Exhibit 13-6) \\ V_{12} = pc/h & V_{12} = V_p + (V_p - V_p) P_{FD} \\ \hline V_{12} = pc/h & V_{12} = 0 & A30 using Equation (Exhibit 13-7) \\ V_{13} \sigma_{13-19} & V_{12} = 3419 pc/h \\ \hline V_{12} = yc/h (Equation 13-16, 13-18, or 13-17) \\ \hline Is V_{3} \sigma_{13-19} & V_{13} = V_{13} + V_{12} & V_{13} & V_{13} & V_{13} & V_{12} & V_{13} & V_{13} & V_{12} & V_{12} & V_{13} & V_{12} & V_{12} & V_{13} & V_{12} & V_{12} & V_{13} & V_{12} & V_{13} & V_{12} & V_{12} & V_{12} & V_{13} & V_{13} & V_{12} & V_{13} & V_{1$	Conversion t	o pc/h Und	der Base	Conditions							
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	(nc/h)	V	DHE	Terrain	%Truck	%Pv		f	f	v = V/PHF	xf xf
$\begin{array}{c c c c c c c } \hline Freeway & 6410 & 0.95 & Level & 3 & 0 & 0.985 & 1.00 & 6649 \\ \hline Ramp & 700 & 0.92 & Level & 2 & 0 & 0.990 & 1.00 & 768 \\ \hline UpStream & 190 & 0.92 & Level & 2 & 0 & 0.990 & 1.00 & 768 \\ \hline UpStream & Merge Areas & Diverge Areas & V_{12} = V_R + (V_F - V_R)P_D & U_{EQ} = & (Equation 13-6 or 13-7) & U_{EQ} = & (Equation 13-14 or 13-7) & U_{2} = & 0.436 & using Equation (Exhibit 13-6) & V_{12} = & 0.436 & using Equation (Exhibit 13-7) & V_{2} = & 0.436 & using Equation (Exhibit 13-7) & V_{2} = & 0.436 & using Equation (Exhibit 13-7) & V_{2} = & 0.436 & using Equation (Exhibit 13-7) & V_{2} = & 0.436 & using Equation (Exhibit 13-7) & V_{2} = & 0.436 & using Equation (Exhibit 13-7) & V_{2} = & 0.436 & using Equation (Exhibit 13-7) & V_{2} = & 0.436 & using Equation (Exhibit 13-7) & V_{2} = & 0.436 & using Equation (Exhibit 13-7) & V_{2} = & 0.436 & using Equation (Exhibit 13-7) & V_{2} = & 0.66 & U_{2} = & 0.06 & V_{2} = & 0.008 & V_{12} = & 0.08 & V_{12} = & U_{12} & U_{13} & U_{13}$	(pc/ii)	(Veh/hr)		Tenain	70 TTUCK	701.00		'HV	'p	V V/I I II	Λ'HV Λ'p
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Freeway	6410	0.95	Level	3	0	0.	985	1.00	68	49
$\begin{array}{c $	Ramp	700	0.92	Level	2	0	0.	990	1.00	76	68
$ \begin{array}{ c c c c c c } \hline DownStream & Diverge Areas & Diverge Influence Area & Dive$	UpStream	190	0.92	Level	2	0	0.	990	1.00	20)9
Merge Areas Diverge Areas Estimation of v_{12} Estimation of v_{12} $v_{12} = v_{R} + (V_{F} - V_{R})^{P}_{FM}$ $v_{12} = V_{R} + (V_{F} - V_{R})^{P}_{FD}$ $v_{12} = pch$ $v_{12} = v_{R} + (V_{F} - V_{R})^{P}_{FD}$ $v_{12} = pch$ $v_{12} = v_{R} + (V_{F} - V_{R})^{P}_{FD}$ $v_{12} = pch$ $v_{12} = 3419 pch$ $v_{30} < v_{wd4} > 2.700 pch?$ Yes $v_{30} < v_{wd4} > 2.700 pch?$ Yes $v_{30} < v_{wd4} > 1.5^{*} v_{12}/2$ Yes $v_{30} < v_{wd4} > 1.5^{*} v_{12}/2$ Yes $v_{30} < v_{wd4} > 1.5^{*} v_{12}/2$ Yes $v_{10} < v_{12} = v_{10} $	DownStream										
Estimation of v_{12} $V_{12} = V_{F} (P_{FM})$ $V_{12} = V_{R} + (V_{F} - V_{R})P_{FD}$ $V_{EQ} =$ (Equation 13-6 or 13-7) $V_{12} = V_{R} + (V_{F} - V_{R})P_{FD}$ $V_{EQ} =$ (Equation 13-6 or 13-7) $V_{12} = V_{R} + (V_{F} - V_{R})P_{FD}$ $V_{12} =$ DA (Equation 13-12 or 13-13) $V_{12} =$ DA $V_{12} =$ DA $V_{12} =$ DA $V_{12} =$ DA V_{3} or $V_{av24} > 2.700$ pc/h? \square Yes \square No Is V_{3} or $V_{av24} > 2.700$ pc/h? \square Yes \square No Is V_{3} or $V_{av24} > 1.5 + V_{12}/2$ \square Yes \square No Is V_{3} or $V_{av24} > 1.5 + V_{12}/2$ \square Yes \square No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-18) Max point (Equation 13-16, 13-18, or 13-18) PCA Capacity Checks Capacity Checks VFO Actual Capacity Checks Flow Entering Merge Influence Area Flow Entering Diverge Influence Area Flow Entering Diverge Influence Area Flow Entering Diverge		I	Merge Areas				-		liverge Areas		
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Estimation of	t v ₁₂				Estimat	ion o	t v ₁₂			
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $		V ₁₂ = V _F	(P _{FM})					V ₁₂ =	V _R + (V _F - \	/ _R)P _{FD}	
$ \begin{array}{c c c c c c c c c } & using Equation (Exhibit 13-6) & P_{FD}^{L} = 0.436 using Equation (Exhibit 13-7) \\ V_{12} = pc/h & V_{12} = 3419 pc/h \\ V_{12} = 3419 pc/h & V_{12} = 3419 pc/h \\ V_{12} = 3419 pc/h & V_{12} = 3419 pc/h \\ V_{12} = 3419 pc/h & V_{12} = 3419 pc/h \\ V_{12} = 3419 pc/h & V_{12} = 3419 pc/h & V_{12} = 3419 pc/h \\ V_{12} = yc/h (Equation 13-14 or 13-17) \\ Is V_3 or V_{av34} > 2,700 pc/h?] Yes] No \\ Is V_3 or V_{av34} > 2,700 pc/h?] Yes] No \\ Is V_3 or V_{av34} > 1.5^* V_{12}/2] Yes] No \\ Is V_3 or V_{av34} > 1.5^* V_{12}/2] Yes] No \\ If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-16, 13-18, or 13-16, 13-18, or 13-19) \\ \hline \begin{tabular}{lllllllllllllllllllllllllllllllllll$	L _{FO} =	(Equa	ition 13-6 or	13-7)		L _{E0} =		(Equation 13-	12 or 13-13)
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	P =	usina	Equation (Fxhibit 13-6)				0,	436 Usina Fa	nuation (Exhi	, hit 13-7)
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	V =	nc/h						0. 24	10 no/h		
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	^v 12	pc/n	Faultion 10) 11 ar 10 17)		$^{v}12$		J4	19 pc/11		
	^v ₃ 01 ^v _{av34}	рс/п (-14 01 13-17)		v ₃ 01 v _{av34}		/ ا ⊐ 0 ا/ د 00	15 pc/n (Eq	uation 13-14	FOF 13-17)
	IS V_3 or $V_{av34} > 2,70$		s 🗌 No			IS V ₃ OF V _{av}	₃₄ > 2,7		Yes ⊻No	1	
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Is V_3 or $V_{av34} > 1.5$	* V ₁₂ /2 Yes	s 🗌 No			Is V ₃ or V _{av}	₃₄ > 1.5	* V ₁₂ /2	Yes 🗹 No		
Total Tota	lf Yes,V _{12a} =	pc/h (13 10)	Equation 13	3-16, 13-18, or		If Yes,V _{12a} =		p	c/h (Equatio	n 13-16, 13-	18, or 13-
Capacity ChecksActualCapacityLOS F?ActualCapacityLOS F? V_{FO} Exhibit 13-8 V_F 6849Exhibit 13-89600No V_{FO} Exhibit 13-8 V_F 6081Exhibit 13-89600No V_{FO} Exhibit 13-8 V_F 6081Exhibit 13-89600No V_{FO} Exhibit 13-8 V_F 6081Exhibit 13-89600No V_{FO} Exhibit 13-8Prove Entering Diverge Influence AreaFlow Entering Diverge Influence AreaActualMax DesirableViolation?ActualMax DesirableViolation? V_{R12} Exhibit 13-8 V_{12} 3419Exhibit 13-84400:AllNoLevel of Service Determination (if not F)Level of Service Determination (if not F)D _R = 4.252 + 0.0086 V ₁₂ - 0.009 L _D D _R = 34.8 (pc/mi/ln)LOS = (pc/mi/ln)D _R = 34.8 (pc/mi/ln)LOS = D (Exhibit 13-2)UOS = D (Exhibit 13-2)UOS = D (Exhibit 13-12)Speed DeterminationM _S = (Exhibit 13-11)D _S = 0.367 (Exhibit 13-12)S _R = mph (Exhibit 13-11)S _R = 59.7 mph (Exhibit 13-12)S _R = mph (Exhibit 13-11)S ₀ = 74.7 mph (Exhibit 13-12)	Canacity Cho	10-19)				Canacit	v Ch		9)		
Actual Colpacity LOS F? Actual Colpacity LOS F? V_{FO} Exhibit 13-8 V_F 6849 Exhibit 13-8 9600 No V_{FO} V_F 6081 Exhibit 13-8 9600 No V_{RO} V_F 6081 Exhibit 13-8 9600 No V_{RO} V_F V_R V_R V_R V_R V_R V_R V_{R12} Exhibit 13-8 Violation? V_{12} 3419 Exhibit 13-8 4400 :All No Level of Service Determination (if not F) $Level of Service Determination (if not F)$ $D_R = 34.8$ (pc/mi/ln) $D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R = 34.8$ (pc/mi/ln) LOS = (Exhibit 13-2) $D_R = 0.367$ (Exhibit 13-2) $S_R = 0.367$ (Exhibit 13-12) S		Actual) anaoit <i>u</i>		<u>Capach</u>		Actual		onooit (
$ \begin{array}{c c c c c c c c c c } V_{FO} & V_{F} & 6849 & Exhibit 13-8 & 9600 & No \\ \hline V_{FO} = V_{F} - V_{R} & 6081 & Exhibit 13-8 & 9600 & No \\ \hline V_{R} & 768 & Exhibit 13-10 & 2100 & No \\ \hline V_{R} & 768 & Exhibit 13-10 & 2100 & No \\ \hline V_{R} & 768 & Exhibit 13-10 & Volation? & Actual & Max Desirable & Violation? & V_{12} & 3419 & Exhibit 13-8 & 4400:All & No \\ \hline V_{R12} & Exhibit 13-8 & V_{12} & 3419 & Exhibit 13-8 & 4400:All & No \\ \hline Level of Service Determination (if not F) & Level of Service Determination (if not F) & D_{R} = 4.252 + 0.0086 V_{12} - 0.009 L_{D} & D_{R} = 34.8 (pc/mi/ln) & D_{R} = 34.8 (pc/mi/ln) & D_{R} = 34.8 (pc/mi/ln) & LOS = D (Exhibit 13-2) & Speed Determination & Speed Determination & M_{S} = (Exhibit 13-11) & S_{R} = mph (Exhibit 13-11) & S_{R} = 59.7 mph (Exhibit 13-12) & S_{R} = 59.7 mph (Exhibit 13-12) & S_{R} = 74.7 mph (Exhibit 13-12) & S_$		Actual			LUGF?	V		Actual	Cubibit 42		
$ \begin{array}{ c c c c c } \hline V_{FO} & Exhibit 13-8 & end{picture} \\ \hline V_{FO} & V_{FO} & V_{F} & 0.081 & Exhibit 13-8 & 9600 & No \\ \hline V_{R} & 768 & Exhibit 13-10 & 2100 & No \\ \hline V_{R} & 768 & Exhibit 13-10 & 2100 & No \\ \hline V_{R} & 768 & Exhibit 13-10 & Volume & Volu$						V _F		6849		-0 9000	INO
V _R 768Exhibit 13-102100NoFlow Entering Diverge Influence AreaFlow Entering Diverge Influence AreaActualMax DesirableViolation?ActualMax DesirableViolation?V _{R12} Exhibit 13-8Violation?ActualMax DesirableViolation?V _{R12} Exhibit 13-8Violation?V123419Exhibit 13-84400:AllNoLevel of Service Determination (if not F)Level of Service Determination (if not F)D _R = 4.252 + 0.0086 V ₁₂ - 0.009 L _D VD _R = 5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A D _R = 34.8 (pc/mi/ln)D _R = 4.252 + 0.0086 V ₁₂ - 0.009 L _D VD _R = (pc/mi/ln)D _R = 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A D _R = 34.8 (pc/mi/ln)D _R = 34.8 (pc/mi/ln)VLOS = (Exhibit 13-2)D _R = 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A D _R = 34.8 (pc/mi/ln)US = D (Exhibit 13-2)VSpeed DeterminationSpeed DeterminationSpeed DeterminationSpeet DeterminationSpeet DeterminationM _S = (Exhibit 13-11)S _R = 0.367 (Exhibit 13-12)S _R = 59.7 mph (Exhibit 13-12)Speet DeterminationS _R = mph (Exhibit 13-11)S ₀ = 74.7 mph (Exhibit 13-12)Speet DeterminationSpeet Determination	V _{FO}		Exhibit 13-8			$V_{FO} = V_{F}$	- V _R	6081	Exhibit 13	-8 9600	No
Flow Entering Merge Influence AreaActualMax DesirableViolation?ActualMax DesirableViolation? V_{R12} Exhibit 13-8Violation?ActualMax DesirableViolation? V_{R12} Exhibit 13-8Violation?Violation?Violation?NoLevel of Service Determination (if not F)Level of Service Determination (if not F)D_R = 4.252 + 0.0086 V ₁₂ - 0.009 L_DD_R $D_R = (pc/mi/ln)$ $D_R = 34.8 (pc/mi/ln)$ $D_R = 34.8 (pc/mi/ln)$ $D_R = 34.8 (pc/mi/ln)$ $D_R = 0.367 (Exhibit 13-2)$ Speed Determination $M_S = (Exibit 13-11)$ $D_S = 0.367 (Exhibit 13-12)$ $S_R = mph (Exhibit 13-11)$ $S_0 = 74.7 mph (Exhibit 13-12)$						V _R		768	Exhibit 13-	10 2100	No
ActualMax DesirableViolation?ActualMax DesirableViolation? V_{R12} Exhibit 13-8 V_{12} 3419Exhibit 13-84400:AllNoLevel of Service Determination (if not F) $D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R = 34.8 (pc/mi/ln)$ $DS = (pc/mi/ln)$ $LOS = D (Exhibit 13-2)$ $LOS = D (Exhibit 13-2)$ $D_S = 0.367 (Exhibit 13-12)$ Speed Determination $M_S = (Exibit 13-11)$ $S_R = 59.7 mph (Exhibit 13-12)$ $S_R = mph (Exhibit 13-11)$ $S_0 = 74.7 mph (Exhibit 13-12)$	Flow Enterin	g Merge In	fluence A	Area		Flow En	terin	q Dive	rge Influei	nce Area	
V_{R12} Exhibit 13-8 V_{12} 3419 Exhibit 13-8 4400:All No Level of Service Determination (if not F) Level of Service Determination (if not F) Level of Service Determination (if not F) $D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R = 34.8 (pc/mi/ln)$ $D_R = (pc/mi/ln)$ $D_R = 34.8 (pc/mi/ln)$ $LOS = D (Exhibit 13-2)$ $LOS = D (Exhibit 13-2)$ Speed Determination Speed Determination $S_R = 0.367 (Exhibit 13-12)$ $S_R = 59.7 mph (Exhibit 13-12)$ $S_0 = 74.7 mph (Exhibit 13-12)$,	Actual	Max	Desirable	Violation?			Actual	Max Desira	able	Violation?
Level of Service Determination (if not F) Level of Service Determination (if not F) $D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R = (pc/mi/ln)$ $D_R = 34.8 (pc/mi/ln)$ LOS = (Exhibit 13-2) LOS = D (Exhibit 13-2) Speed Determination Speed Determination $M_S = (Exhibit 13-11)$ $D_S = 0.367 (Exhibit 13-12)$ $S_R = mph (Exhibit 13-11)$ $S_R = 59.7 mph (Exhibit 13-12)$ $S_0 = mph (Exhibit 13-11)$ $S_0 = 74.7 mph (Exhibit 13-12)$	V _{R12}		Exhibit 13-8			V ₁₂		3419	Exhibit 13-8	4400:All	No
D _R = 5.475 + 0.00734 v _R + 0.0078 V ₁₂ - 0.00627 L _A D _R = 4.252 + 0.0086 V ₁₂ - 0.009 L _D D _R = (pc/mi/ln) D _R = 34.8 (pc/mi/ln) LOS = (Exhibit 13-2) LOS = D (Exhibit 13-2) Speed Determination Speed Determination M _S = (Exhibit 13-11) D _s = 0.367 (Exhibit 13-12) S _R = mph (Exhibit 13-11) S _R = 59.7 mph (Exhibit 13-12) S ₀ = mph (Exhibit 13-11) S ₀ = 74.7 mph (Exhibit 13-12)	l evel of Serv	ı vice Detern	nination ((if not F)		l evel of	Ser	vice De	terminatio	n (if not	F)
$D_R = (pc/mi/ln)$ $D_R = 34.8 (pc/mi/ln)$ $LOS = (Exhibit 13-2)$ $LOS = D (Exhibit 13-2)$ Speed Determination Speed Determination $M_S = (Exhibit 13-11)$ $D_s = 0.367 (Exhibit 13-12)$ $S_R = mph (Exhibit 13-11)$ $S_0 = 74.7 mph (Exhibit 13-12)$	$D = 5475 \pm 0$	00734 v + 0	0.0078.V	- 0.006271		2010/0/	D = 4	252 + 0	0086 V - 0	0091	/
$D_R =$ (pc/mi/in) $LOS =$ (Exhibit 13-2) $LOS =$ (Exhibit 13-2) Speed Determination Speed Determination $M_S =$ (Exhibit 13-11) $S_R =$ mph (Exhibit 13-11) $S_n =$ mph (Exhibit 13-11) $S_0 =$ 74.7 mph (Exhibit 13-12)	$D_{\rm R} = 5.475 \pm 0.00734$ V $_{\rm R} \pm 0.0078$ V $_{12} = 0.00027$ L $_{\rm A}$					D - 0		, .,, .	12		
LOS = (Exhibit 13-2) LOS = D (Exhibit 13-2) Speed Determination Speed Determination M_S = (Exibit 13-11) D_s = 0.367 (Exhibit 13-12) S_R = mph (Exhibit 13-11) S_R = 59.7 mph (Exhibit 13-12) S_0 = mph (Exhibit 13-11) S_0 = 74.7 mph (Exhibit 13-12)	$D_R = (pc/m/m)$					D _R = 34.8 (pc/mi/ln)					
Speed Determination Speed Determination M_s = (Exibit 13-11) D_s = 0.367 (Exhibit 13-12) S_R = mph (Exhibit 13-11) S_R = 59.7 mph (Exhibit 13-12) S_0 = mph (Exhibit 13-11) S_0 = 74.7 mph (Exhibit 13-12)	LOS = (Exhibit	13-2)				LOS = D	(Exhil	oit 13-2)			
$M_S =$ (Exibit 13-11) $D_s =$ 0.367 (Exhibit 13-12) $S_R =$ mph (Exhibit 13-11) $S_R =$ 59.7 mph (Exhibit 13-12) $S_0 =$ mph (Exhibit 13-11) $S_0 =$ 74.7 mph (Exhibit 13-12)	Speed Determination					Speed L	Deter	minatio	n		
$S_{R}^{=}$ mph (Exhibit 13-11) $S_{R}^{=}$ 59.7 mph (Exhibit 13-12) $S_{0}^{=}$ mph (Exhibit 13-11) $S_{0}^{=}$ 74.7 mph (Exhibit 13-12)	M _s = (Exibit 1	M _s = (Exibit 13-11)				D _s = 0.367 (Exhibit 13-12)					
$S_0 = mph (Exhibit 13-11)$ $S_0 = 74.7 mph (Exhibit 13-12)$	$S_{p} = mnh (Fxh)$, nibit 13-11)				S _R = 59).7 mph	(Exhibit	13-12)		
		nihit 13_11)				S ₀ = 74	I.7 moh	(Exhibit	, 13-12)		
S = mph (Exhibit 13-13) $S = 65.6 mph (Exhibit 13-13)$	S = mnh (Evt)	nibit 13-13)				S = 65	56 mnh	(Evhibit	, 13_13)		
		w of Florida All D	ights Possaved						10 10)	Generated: (5/18/2020 2.4.



	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 13-I	Bet Off & On Ramps
Project Description SW 10	th Street SIMR		Analysis fear	2020 Bu	110 2
Qper (LOS			Des (N)	Pla	Inning Data
Flow Inputs	/	·			
Volume, V AADT Peak-Hr Prop. of AADT, K	4640	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R	0.95 3 0	
Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	General Terrain: Grade % Length Up/Down %	Level mi	
Calculate Flow Adjust	ments				
f _ρ Ε _Τ	1.00 1.5		E _R f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	1.2 0.985	
Speed Inputs			Calc Speed Adi and FFS	3	
Lane Width Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured) Base free-flow Speed, BFFS	3 70.0	ft ft ramps/mi mph mph	f _{LW} f _{LC} TRD Adjustment FFS	70.0	mph mph mph mph
LOS and Performance	Measures		Design (N)		
<u>Operational (LOS)</u> v _p = (V or DDHV) / (PHF x N S D = v _p / S LOS	x f _{HV} x f _p) 1652 67.6 24.4 C	pc/h/ln mph pc/mi/ln	Design (N) Design LOS v _p = (V or DDHV) / (PHF x N x S D = v _p / S Required Number of Lanes, N	f _{HV} x f _p)	pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design h	S - Speed D - Density FFS - Free-flow BFFS - Base fre our volume	speed ee-flow speed	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2	13 2, 11-3	f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

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		F	REEWAY	(WEAV	ING WOF	RKSHEE	Г				
Genera	I Informatio	on			Site Info	rmation					
Analyst Agency/Cor Date Perfor Analysis Tir	npany med ne Period	AECON PM	1		Freeway/Dir of TravelI-95 SBWeaving Segment LocationSeg 14- Bet Sample & CopansAnalysis Year2020 Build 2						
Project Des	cription SW 10th	n Street SIMR									
Inputs											
Weaving co Weaving nu Weaving se Freeway fre	nfiguration Imber of lanes, N Igment length, L _s Pe-flow speed, FF	S		One-Sided 4 2520ft 70 mph	Segment typ Freeway min Freeway ma: Terrain type	e imum speed kimum capac	, S _{MIN} ity, C _{IFL}		Freeway 15 2400 Level		
Conver	sions to po	/h Unde	r Base Co	ondition	s		1	Ĩ	-		
	V (veh/h)	PHF	Truck (%)	RV (%)	Ε _Τ	E _R	f _{HV}	fp	v (pc/h)		
V _{FF}	3995	0.95	3	0	1.5	1.2	0.985	1.00	4268		
V _{RF}	1410	0.92	2	0	1.5	1.2	0.990	1.00	1548		
V _{FR}	645	0.92	2	0	1.5	1.2	0.990	1.00	708		
V _{RR}	0	0.95	0	0	1.5	1.2	1.000	1.00	0		
V _{NW}	4268				-		-	V =	6524		
V _W	2256							-			
VR	0.346										
Configu	uration Cha	racterist	ics		•						
Minimum m	naneuver lanes, N	N _{WL}		2 lc	Minimum we	aving lane cl	nanges, LC _{MIN}	I	2256 lc/h		
Interchange	e density, ID			0.7 int/mi	Weaving lan	e changes, L	.C _w		2705 lc/h		
Minimum R	F lane changes,	LC _{RF}		1 lc/pc	Non-weaving	g lane chang	es, LC _{NW}		1475 lc/h		
Minimum F	R lane changes,	LC _{FR}		1 lc/pc	Total lane ch	nanges, LC _{AL}	L		4180 lc/h		
Minimum R	R lane changes,	LC_{RR}		lc/pc	Non-weaving	g vehicle inde	ex, I _{NW}		753		
Weavin	g Segment	Speed,	Density, I	_evel of	Service,	and Cap	oacity				
Weaving se Weaving se	egment flow rate, egment capacity,	v c _w		6439 veh/h 6838 veh/h	Weaving inte Weaving sec	ensity factor, gment speed	W , S		0.337 49.0 mph		
Weaving se	egment v/c ratio			0.942	Average wea	aving speed,	Sw		56.1 mph		
Weaving se	egment density, [)	33	3.3 pc/mi/ln	Average nor	-weaving sp	eed, S _{NW}		45.9 mph		
Level of Se	rvice, LOS			D	Maximum we	eaving length	i, L _{max}		6080 ft		
Notes a. Weaving s Chapter 13, ' b. For volum	segments 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 ne level of sei	be treated as is rvice is "F".	olated merge	and diverge ar	eas using the	procedures of		

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	RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Infor	rmation			Site Infor	mation					
Analyst			Fr	eeway/Dir of Tr	avel	I-95 NE	B Express L	ane		
Agency or Company	AEC	OM	Ju	Inction	(Off to S	SW 10th Co	nnector		
Date Performed	d AM		Ju Ar	risdiction Voar		2020 B	uild 2			
Project Description	SW 10th Stree	t SIMR		arysis real		2020 D				
Inputs										
Linstroom Adi E	Jamp	Freeway Nun	nber of Lanes, N	2				l,	Downstroo	m Adi
	kanip	Ramp Numbe	er of Lanes, N	1				F	Ramp	n Auj
Yes	On	Acceleration	Lane Length, L.							
	7 .0%	Deceleration	Lane Length L_{a}	345					L Yes	On
I NO L	_ Off	Freeway Volu	ime. V _e	1110					✓ No	Off
L _{up} = 1	ft	Ramp Volum	e V_	60				l	-down =	ft
up		Freeway Free	-Flow Speed S	70.0						
V _u = v	reh/h	Ramn Free-F	low Speed S	60.0					√ _D =	veh/h
Conversion t	to nc/h Un	dor Basa	Conditions	00.0						
Conversion			Conditions				.	.		
(pc/h)	(Veh/hr)	PHF	Terrain	%Truck	%Rv		f _{HV}	f _p	/ = V/PHF :	k f _{HV} x f _p
Freeway	1110	0.95	Level	3	0	0.	985	1.00	118	6
Ramp	60	0.95	Level	2	0	0.	990	1.00	64	
UpStream						+				
DownStream		Merge Areas					I	iverne Areas		
Estimation o	f Via	merge meus			Estimati	ion o	f V ₄₂	Weige Alleus		
	12 V - V	(P)					1 <u>2</u>	V + (V - V)	\D	
_	V ₁₂ - V _F	$(_{FM})$	12 7)				v ₁₂ –	^{v}R ' (^{v}F ^{-}vR	/「FD 2 or 12 12)	
E _{EQ} -	(Equa	Equation (IJ-7		EQ -		(L		2 01 13-13)	H 10 7)
FM -	using nc/b		Exhibit 15-0)		FD -		1.0	00 using ⊑qu		11 13-7)
V_{12}	pc/n	Equation 13	11 or 13 17)		V_{12} – V or V		0	oo pc/n	n 12 14 or	10 17)
v_3 or v_{av34}	$p_{0,nc/h} = \frac{1}{2} \sqrt{n}$		5-14-01-15-17)		ls V or V	<u>\</u> 27	0 00.pc/b2 □	Vee	113-14 01	13-17)
$V_{3} \text{ or } V_{av34} > 2,70$					Is V or V	34 ~ 2,7 < 1 5	* V/ /2			
13 V ₃ 01 V _{av34} / 1.5	^v ₁₂ ^{/2} mre	Fouation 13	3-16, 13-18, or			34 ~ 1.5	^v 12 ^{/2}	∴res into c/h (Fouation	13-16, 13-1	18. or 13-
If Yes,V _{12a} =	13-19)			If Yes,V _{12a} =		19))		
Capacity Che	ecks				Capacity	y Ch	ecks			
	Actual	(Capacity	LOS F?			Actual	Cap	acity	LOS F?
					V _F		1186	Exhibit 13-8	4800	No
V _{FO}		Exhibit 13-8			$V_{FO} = V_{F}$	- V _R	1122	Exhibit 13-8	4800	No
					V _R		64	Exhibit 13-10	2200	No
Flow Entering	g Merge In	fluence A	Area		Flow En	terin	g Diver	ge Influend	ce Area	
	Actual	Мах	Desirable	Violation?		1	Actual	Max Desirabl	е	Violation?
V _{R12}		Exhibit 13-8			V ₁₂	1	186	Exhibit 13-8	4400:All	No
Level of Serv	vice Deterr	mination	(if not F)		Level of	Serv	/ice De	termination	n (if not F)
D _R = 5.475 + 0.	.00734 v _R +	0.0078 V ₁₂	- 0.00627 L _A		[[) _R = 4	.252 + 0.	0086 V ₁₂ - 0.0	09 L _D	
D _R = (pc/mi/In	ו)				D _R = 11	.3 (pc /	/mi/ln)			
LOS = (Exhibit	13-2)				LOS = B	(Exhit	oit 13-2)			
Speed Deterr	mination				Speed D	Deter	minatio	n		
M _s = (Exibit 1	3-11)				D _s = 0.1	109 (E	xhibit 13-	12)		
$S_{p} = mph (Fxh)$, nibit 13-11)				S _R = 67	.0 mph	(Exhibit	13-12)		
$S_0 = mph (Ext)$	$S_{n} = mph (Exhibit 13-11)$					A mph	(Exhibit 1	3-12)		
S = mph (Exh	nibit 13-13)				S = 67	.0 mph	(Exhibit	13-13)		

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	RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Infor	mation			Site Infor	mation					
Analyst			Fre	eeway/Dir of Tra	avel	I-95 N	B Express L	anes		
Agency or Company	AECO	MC	Ju	nction		On fro	m SW 10th	St. Connector		
Date Performed Analysis Time Perior			JU An	risdiction alvsis Year		2020 8	Ruild 2			
Project Description	SW 10th Stree	t SIMR	7.0			20201				
Inputs										
Linstream Adi Ramn		Freeway Num	ber of Lanes, N	2					Downstre	am Adi
		Ramp Numbe	er of Lanes, N	1					Ramp	ann Aaj
Yes Or	ı	Acceleration I	Lane Length, L _A	1040					TYes	□ On
	f	Deceleration	Lane Length L _D							
	1	Freeway Volu	ime, V _F	1050					M NO	U Off
L _{up} = ft		Ramp Volume	e, V _R	760					L _{down} =	ft
		Freeway Free	e-Flow Speed, S _{FF}	70.0					V =	veh/h
v _u = veh/h	l	Ramp Free-F	low Speed, S _{FR}	60.0					v _D –	ven/n
Conversion t	o pc/h Und	der Base	Conditions							
(pc/h)	V	PHF	Terrain	%Truck	%Rv		f _{LN/}	f	v = V/PHF	x f _{uv} x f
Erooway	(Veh/hr)	0.05	Loval	2	0		005	p 1.00	-	122
Ramn	760	0.95	Level	2 2	0		900	1.00		808
UpStream	700	0.75	Level	2	Ŭ		.,,,,	1.00		000
DownStream										
	- I	Merge Areas				-	D	iverge Areas		
Estimation of	^v ₁₂				Estimat	on o	of V ₁₂			
	$V_{12} = V_{F}$	(P _{FM})					V ₁₂ = \	/ _R + (V _F - V _F	_R)P _{FD}	
L _{EQ} =	(Equa	ation 13-6 o	r 13-7)		L _{EQ} =		(Equation 13	-12 or 13-1	3)
P _{FM} =	1.000	using Equa	tion (Exhibit 13-6)		P _{FD} =		U	ising Equation	on (Exhibit 1	3-7)
V ₁₂ =	1122	oc/h			V ₁₂ =		p	oc/h		
V ₃ or V _{av34}	0 pc/ł	n (Equation	13-14 or 13-17)		V_3 or V_{av34}		þ	oc/h (Equation	13-14 or 13-1	7)
Is V_3 or $V_{av34} > 2,70$	0 pc/h? Ye	s 🗹 No			Is V_3 or V_{av3}	₃₄ > 2,7	700 pc/h?	Yes No)	
Is V_3 or $V_{av34} > 1.5$	[•] V ₁₂ /2 Ye	s 🗹 No	0 40 40 40		Is V_3 or V_{av3}	₃₄ > 1.5	5 * V ₁₂ /2	Yes No)	0.40
If Yes,V _{12a} =	pc/n (13-19)	Equation 1.	3-16, 13-18, or		If Yes,V _{12a} =		р 13	c/n (Equatio 3-19)	on 13-16, 1	3-18, OF
Capacity Che	cks				Capacit	y Ch	ecks			
	Actual	(Capacity	LOS F?			Actual	Ca	apacity	LOS F?
					V _F			Exhibit 13	-8	
VEO	1930	Exhibit 13-8		No	$V_{FO} = V_{F}$	- V _R		Exhibit 13	-8	
FO					Vn			Exhibit 13	3-	
Elever Endersin		fluoree				4 - 11		10		
Flow Entering	g ivierge in Actual	TIUENCE A	A rea Dosirablo	Violation?	FIOW EN		Actual	<u>ge influei</u> Max Dos	nce Area	Violation?
Vera	2064	Exhibit 13-8	4600·All	No	Via	+	Actual	Exhibit 13-8		violation:
Level of Serv	ice Detern	nination ((if not F)	110	l evel of	Ser	vice De	terminatio	n (if not	F
$D_{-} = 5.475 +$	$0.00734 \text{ y}_{-} + 0$	0078 V 0	006271.)_ = /	4 252 + 0	$0086 V_{} - 000000000000000000000000000000000$	0091-	•)
$D_{\rm p} = 13.6 ({\rm nc/m})$	u/In)		COOLT LA		D_ = (n	-R c/mi/	In)	12		
$I_{R} = B(Exhibit)$	13-2)				PR (P	xhihi	t 13-2)			
Speed Deterr	nination				Speed [rminatio	n		
	hit 12 11)				$D_{r} = (F$	xhibit	13-12)	••		
$V_{\rm S}^{-} = 0.227$ (EXI	UIL IJ-11) (Evhibit 12 11)				S _D = mi	oh (Fx	hibit 13-12)			
P_R^- os.o mpn S = N/A mmb /	(EXIIIDIL 13 - 11)				S _o = m	oh (Fv	hibit 13-12)			
P_0 = N/A mph (S = 63.6 mph	$S_0 = N/A \text{ mph (Exhibit 13-11)}$ $S_0 = mph (Exhibit 13-12)$ $S_0 = mph (Exhibit 13-12)$									
S = 63.6 mph (Exhibit 13-13) S = mph (Exhibit 13-13)										

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	RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Info	rmation			Site Infor	mation					
Analyst			Fr	eeway/Dir of Tr	avel	I-95 SB	Express L	ane		
Agency or Company	AEC	OM	Ju	Inction	(Off to S	SW 10th Co	nnector		
Date Performed	d AM		JU Ar	risdiction Voar		2020 B	uild 2			
Project Description	SW 10th Stree	et SIMR			· · · · · ·	2020 D				
Inputs										
Linstroam Adi I	Damn	Freeway Nun	nber of Lanes, N	2					Downstreau	m Adi
Opsilean Auj I	vanip	Ramp Numbe	er of Lanes, N	1					Ramp	плај
Yes [On	Acceleration	Lane Length, L _₄							On
No	Off	Deceleration	Lane Length L _D	250						
		Freeway Volu	ume, V _F	1010					MO NO	Off
L _{up} =	ft	Ramp Volum	e, V _R	370				I	-down =	ft
N/ _		Freeway Free	e-Flow Speed, S _{FF}	70.0				,	/ =	voh/h
$V_u = V_u$	/eh/h	Ramp Free-F	low Speed, S _{FR}	60.0					v _D -	ven/n
Conversion	to pc/h Un	der Base	Conditions					I		
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv		f _{HV}	f _p	/ = V/PHF >	۲ f _{HV} x f _p
Freeway	1010	0.95	Level	3	0	0.	985	1.00	107	9
Ramp	370	0.95	Level	2	0	0.	990	1.00	393	3
UpStream						4				
DownStream		Morgo Arooc						Niverge Areas		
Estimation o	fv	werge Areas			Fstimati	ion o	of V	nverge Areas		
	<u>12</u>						<u>12</u>		<u>\</u>	
	$V_{12} = V_F$	(P _{FM})	40.7)				V ₁₂ =	V _R + (V _F - V _R)P _{FD}	
L _{EQ} =	(Equa	Tauratian (13-7)		L _{EQ} =		(1		2 OF 13-13)	
F _{FM} =	using	Equation (EXHIDIT 13-0)		FD =		1.0	JUU using Equ	ation (Exhib	IL 13-7)
$v_{12} = 12$	pc/n	Equation 10	(14 - 12 + 17)		$v_{12} =$		10	1/9 pc/n	10 11	40.47)
$v_3 \cup v_{av34}$	punn (00 nc/b2 ⊡va		5-14 01 13-17)		$v_3 \cup v_{av34}$	、 2 7	0 □ pc/b2	pc/n (Equation	11 13-14 01	13-17)
$15 V_3 01 V_{av34} > 2,7$	*V /2 UVa				$15 V_3 01 V_{av3}$	34 > 2,7 > 1 5	* V /2 E			
$13 v_3 01 v_{av34} > 1.5$	^v ₁₂ ^{/2} mre	Fouation 13	3-16, 13-18, or			34 > 1.5	v ₁₂ /∠ ∟	_ res ⊻ No c/h (Fquation	13-16, 13-1	8. or 13-
If Yes,V _{12a} =	13-19)	,,,		If Yes,V _{12a} =		19	9)	,	-,
Capacity Ch	ecks				Capacity	y Ch	ecks			
	Actual	(Capacity	LOS F?			Actual	Cap	bacity	LOS F?
					V _F		1079	Exhibit 13-8	4800	No
V _{FO}		Exhibit 13-8			$V_{FO} = V_{F}$	- V _R	686	Exhibit 13-8	4800	No
					V _R		393	Exhibit 13-10	2200	No
Flow Enterin	g Merge Ir	nfluence A	Area		Flow En	terin	g Diver	rge Influend	ce Area	
	Actual	Max	Desirable	Violation?			Actual	Max Desirabl	е	Violation?
V _{R12}		Exhibit 13-8			V ₁₂	1	079	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of	Ser	/ice De	termination	n (if not F)
D _R = 5.475 + 0	.00734 v _R +	0.0078 V ₁₂	- 0.00627 L _A			2 _R = 4	.252 + 0.	.0086 V ₁₂ - 0.0	009 L _D	
D _R = (pc/mi/lı	ר)				D _R = 11	.3 (pc /	/mi/ln)			
LOS = (Exhibit	13-2)				LOS = B	(Exhib	oit 13-2)			
Speed Determination					Speed D)eter	minatio	on		
M _S = (Exibit 1	3-11)				D _s = 0.1	138 (E	xhibit 13-	12)		
S _R = mph (Ex	hibit 13-11)				S _R = 66	.1 mph	(Exhibit	13-12)		
S ₀ = mph (Ex	hibit 13-11)				S ₀ = N/	A mph	(Exhibit 1	13-12)		
S = mph (Ex	hibit 13-13)				S = 66.1 mph (Exhibit 13-13)					

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General Info	rmation			Site Infor	mation					
Analyst Agency or Company		OM	Fre	eeway/Dir of Tra	avel	1-95 S On fro	B Express L	anes St. Connoctor		
Date Performed	y AECO	UIVI	Jur	risdiction		UITIIU				
Analysis Time Peric	od AM		An	alysis Year		2020 [Build 2			
Project Description	SW 10th Stree	t SIMR								
mpuis		Frooway Num	her of Lanes N	n						
Upstream Adj Ram	р	Ramp Numbe	r of Lanes N	2					Downstrea Ramp	am Adj
□Yes □O	'n	Acceleration I	Lane Length, L_{A}	1100						□ On
⊠No □O	off	Deceleration	Lane Length L _D						⊠ No	
		Freeway Volu	me, V _F	640						4 C.
L _{up} = ft		Ramp Volume	e, V _R	160					∟ _{down} =	п
V _u = veh/	h	Freeway Free	-Flow Speed, S _{FF}	70.0					V _D =	veh/h
	(Ramp Free-F	low Speed, S _{FR}	60.0						
Conversion	to pc/n Und	der Base	Conditions		r	-				
(pc/h)	v (Veh/hr)	PHF	Terrain	%Truck	%Rv		f _{HV}	f _p	v = V/PHF	^F x f _{HV} x f _p
Freeway	640	0.95	Level	3	0	0	.985	1.00		584
Ramp	160	0.95	Level	2	0	0	.990	1.00	· · · ·	170
UpStream DownStream						-				
Downourcum		Merge Areas				_	I D	iverge Areas	I	
Estimation o	of v ₁₂	-			Estimati	ion d	of v ₁₂	-		
	$V_{12} = V_{F}$	(P _{FM})					V ₁₂ = \	/ _R + (V _F - V _R)P _{ED}	
L _{FO} =	(Equa	ation 13-6 o	r 13-7)		L _{FO} =		(Equation 13-	12 or 13-1	3)
P _{FM} =	1.000	using Equat	tion (Exhibit 13-6)		P _{FD} =		U	ising Equation	on (Exhibit 13	3-7)
V ₁₂ =	684 p	c/h			V ₁₂ =		p	oc/h		
V ₃ or V _{av34}	0 pc/l	h (Equation	13-14 or 13-17)		V_3 or V_{av34}		þ	oc/h (Equation ²	13-14 or 13-1	7)
Is V_3 or $V_{av34} > 2,7$	'00 pc/h? 🗌 Ye	s 🗹 No			Is V_3 or V_{av3}	₈₄ > 2,7	700 pc/h? 🗌	Yes 🗌 No		
Is V_3 or $V_{av34} > 1.5$	5 * V ₁₂ /2 ∐Ye	s 🗹 No			Is V_3 or V_{av3}	₃₄ > 1.5	5 * V ₁₂ /2	Yes 🗌 No		
If Yes,V _{12a} =	pc/h 13-19)	(Equation 13	3-16, 13-18, or		If Yes,V _{12a} =		p 13	oc/h (Equatio	n 13-16, 13	3-18, or
Capacity Ch	ecks				Capacity	v Ch	ecks	, 10)		
	Actual	(Capacity	LOS F?		, 	Actual	Са	pacity	LOS F?
					V _F			Exhibit 13-	8	
V _{EO}	854	Exhibit 13-8		No	$V_{FO} = V_{F}$	- V _R		Exhibit 13-	8	
					V _R			Exhibit 13	-	
Flow Enterin	na Merae In	fluence A	Area		Flow En	terii	na Diver	ae Influer	ice Area	
	Actual	Max	Desirable	Violation?			Actual	Max Des	irable	Violation?
V _{R12}	936	Exhibit 13-8	4600:All	No	V ₁₂			Exhibit 13-8		
Level of Ser	vice Detern	nination (ïf not F)		Level of	Ser	vice De	terminatio	on (if not	F)
D _R = 5.475	+ 0.00734 v _R + 0	0.0078 V ₁₂ - 0.	00627 L _A		[[D _R = -	4.252 + 0.	0086 V ₁₂ - 0	.009 L _D	
D _R = 5.2 (pc/m	ni/In)				D _R = (p	c/mi/	ln)			
LOS = A (Exhibi	t 13-2)				LOS = (E	xhibi	t 13-2)			
Speed Deter	mination				Speed D)eter	rminatio	n		
M _S = 0.199 (E)	kibit 13-11)				$D_s = (E)$	xhibit	13-12)			
S _R = 64.4 mph	n (Exhibit 13-11)				S _R = mp	oh (Ex	hibit 13-12)			
$S_0 = N/A mph (Exhibit 13-11)$ $S_0 = mph (Exhibit 13-12)$										
S = 64.4 mph (Exhibit 13-13) S = 64.4 mph (Exhibit 13-13)										

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	RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Info	rmation			Site Infor	mation					
Analyst			Fr	eeway/Dir of Tr	avel	I-95 NB	B Express L	.ane		
Agency or Company	AEC	OM	Ju	Inction	(Off to S	SW 10th Co	nnector		
Date Performed	d DM		Ju Ar	risdiction Voar		2020 B	uild 2			
Project Description	SW 10th Stree	et SIMR			· · · · · ·	2020 D				
Inputs										
Linstroam Adi [Damn	Freeway Nun	nber of Lanes, N	2					Downstreau	m Adi
Opsiteant Auj 1	vanip	Ramp Numbe	er of Lanes, N	1					Ramp	плај
Yes	On	Acceleration	Lane Length, L _₄							
No	Off	Deceleration	Lane Length L _D	345						
		Freeway Volu	ume, V _F	890					MO NO	Off
L _{up} =	ft	Ramp Volum	e, V _R	150				I	-down =	ft
V -		Freeway Free	e-Flow Speed, S _{FF}	70.0				,	/ =	veh/h
$v_u = v_u$	/eh/h	Ramp Free-F	low Speed, S _{FR}	60.0					v _D -	ven/n
Conversion	to pc/h Un	der Base	Conditions					I		
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv		f _{HV}	f _p	/ = V/PHF >	k f _{HV} x f _p
Freeway	890	0.95	Level	3	0	0.	985	1.00	95	1
Ramp	150	0.95	Level	2	0	0.	990	1.00	159	7
UpStream						<u> </u>				
DownStream		Morgo Arooc						Niverge Areas		
Estimation o	fv	werge Areas			Fstimati	ion o	of V	nverge Areas		
	<u>12</u>						<u>12</u>		<u>\</u>	
	$V_{12} = V_F$	(P _{FM}) stice 12.6 or	10 7)				v ₁₂ =	$V_R + (V_F - V_R)$)P _{FD} 2 ar 12 12)	
L _{EQ} =	(⊏qua		13-7		L _{EQ} =		(1		2 01 13-13)	(1 1 0 7)
FFM -	using	Equation (EXHIBIT 13-0)		FD -		1.0	J00 using ∈qu	auon (Exnip	IL 13-7)
$v_{12} - v_{12} - v$	pc/n	Equation 12	(14 or 12 17)		$v_{12} = 12$		95	o pc/n 	- 40 44	40 47)
$v_3 \cup v_{av34}$	punn (00 nc/b2 ⊡va		5-14 01 13-17)		$v_3 \cup v_{av34}$	 	0 □ pc/b2	pc/n (Equation	11 13-14 01	13-17)
$15 V_3 01 V_{av34} > 2,7$	*V /2 UVa				$15 V_3 01 V_{av3}$	34 × 2, 1	* V /2 E			
$13 v_3 01 v_{av34} > 1.3$	^v ₁₂ ^{/2} mre	Fouation 13	3-16, 13-18, or			34 > 1.5	v ₁₂ /∠ ∟	_ res ⊻ No c/h (Fquation	13-16, 13-1	18. or 13-
If Yes,V _{12a} =	13-19)			If Yes,V _{12a} =		19	9)		
Capacity Ch	ecks				Capacity	y Che	ecks			
	Actual	(Capacity	LOS F?			Actual	Cap	bacity	LOS F?
					V _F		951	Exhibit 13-8	4800	No
V _{FO}		Exhibit 13-8			$V_{FO} = V_{F}$	- V _R	792	Exhibit 13-8	4800	No
					V _R		159	Exhibit 13-10	2200	No
Flow Enterin	g Merge Ir	nfluence A	Area		Flow En	terin	g Diver	rge Influend	ce Area	
	Actual	Max	Desirable	Violation?			Actual	Max Desirabl	е	Violation?
V _{R12}		Exhibit 13-8			V ₁₂	-	951	Exhibit 13-8	4400:All	No
Level of Service Determination (if not F)					Level of	Serv	/ice De	termination	n (if not F)
D _R = 5.475 + 0			2 _R = 4	.252 + 0.	.0086 V ₁₂ - 0.0	009 L _D				
D _R = (pc/mi/lr	ר)				D _R = 9.3	3 (pc/r	ni/ln)			
LOS = (Exhibit	13-2)				LOS = A	(Exhib	oit 13-2)			
Speed Deter	mination				Speed D	Deter	minatio	on		
M _S = (Exibit 1	3-11)				D _s = 0.1	117 (E :	xhibit 13-	12)		
S _R = mph (Exi	hibit 13-11)				S _R = 66	.7 mph	(Exhibit	13-12)		
S ₀ = mph (Exi	hibit 13-11)				S ₀ = N/	A mph	(Exhibit 1	13-12)		
S = mph (Ex	hibit 13-13)				S = 66.7 mph (Exhibit 13-13)					

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RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Info	rmation			Site Infor	mation					
Analyst Agency or Company Date Performed	AECO	DM	Fre Ju Ju	eeway/Dir of Tra nction risdiction	avel	I-95 N On fro	B Express L m SW 10th	anes St. Connector		
Analysis Time Perio	d PM		An	alysis Year		2020 I	Build 2			
Project Description	SW 10th Street	t SIMR								
Inputs		1							1	
Upstream Adj Ramp	•	Freeway Nun Ramp Numbe	nber of Lanes, N er of Lanes, N	2 1					Downstrea Ramp	am Adj
Yes O	n	Acceleration	Lane Length, L _A	1040					Yes	On
✓ No O	ff	Deceleration Freeway Volu	Lane Length L _D	740					🗹 No	Off
L _{up} = ft		Ramp Volum	e, V _R	390					L _{down} =	ft
V _u = veh/ł	ı	Freeway Free Domp Free F	e-Flow Speed, S _{FF}	70.0					V _D =	veh/h
Conversion	to no/h Un		Conditions	00.0						
Conversion			Conditions		r	<u> </u>				
(pc/h)	(Veh/hr)	PHF	Terrain	%Truck	%Rv		f _{HV}	f _p	v = V/PHF	x f _{HV} x f _p
Freeway	740	0.95	Level	3	0	0	.985	1.00		791
Ramp	390	0.95	Level	2	0	0	.990	1.00	4	115
DownStream						+				
	· · · · · ·	Merge Areas					I D	iverge Areas	1	
Estimation o	f v ₁₂				Estimati	ion d	of v ₁₂			
	$V_{12} = V_{E}$	(P _{EM})					$V_{12} = 1$	/ _D + (V _E - V _E)P _{ED}	
L _{EO} =	(Equa	ation 13-6 o	r 13-7)		L _{EO} =		12 (Equation 13	-12 or 13-1	3)
P _{EM} =	1.000	using Equa	tion (Exhibit 13-6)		P _{ED} =		Ĺ	, ising Equatio	on (Exhibit 13	, 3-7)
$V_{12} =$	791 p	c/h	($V_{12} =$		p	oc/h	,	,
V_2 or $V_{2\nu^24}$, 1/3a 0	(Equation	13-14 or 13-17)		V_{2}^{12} or V_{2}^{12}		r	c/h (Equation ⁻	13-14 or 13-1	7)
$I_{\rm S} V_2 \text{ or } V_{2 \nu 2 4} > 2.7$	00 pc/h? 🗌 Yes	s VNo	,		Is V_2 or V_{2V^2}	, > 2,	' 700 pc/h? ∏	Yes No		,
Is V_2 or $V_{2\nu^2 4} > 1.5$	* V ₁₂ /2 Yes	s VNo			Is V_2 or V_{av2}	, > 1.	5 * V ₁₂ /2 ∏	Yes No		
If Yes,V _{12a} =	pc/h (13-19)	Equation 1	3-16, 13-18, or		If Yes, V _{12a} =	14	12 – F 13	oc/h (Equatio 3-19)	on 13-16, 13	3-18, or
Capacity Che	ecks				Capacity	y Ch	ecks	- /		
	Actual	(Capacity	LOS F?			Actual	Са	pacity	LOS F?
					V _F			Exhibit 13-	8	
V _{FO}	1206	Exhibit 13-8		No	V _{FO} = V _F	- V _R		Exhibit 13-	8	
					V _R			Exhibit 13	5-	
Flow Enterin	g Merge In	fluence A	Area		Flow En	terii	ng Diver	ge Influer	nce Area	
	Actual	Max	Desirable	Violation?			Actual	Max Des	irable	Violation?
V _{R12}	1300	Exhibit 13-8	4600:All	No	V ₁₂			Exhibit 13-8		
Level of Serv	vice Detern	nination ((if not F)		Level of	Ser	vice De	terminatio	on (if not	F)
D _R = 5.475 +	- 0.00734 v _R + 0).0078 V ₁₂ - 0.	00627 L _A		[[) _R =	4.252 + 0.	0086 V ₁₂ - 0	.009 L _D	
D _R = 8.2 (pc/m	/ln)				D _R = (p	c/mi/	ln)			
LOS = A (Exhibit	13-2)				LOS = (E	xhibi	t 13-2)			
Speed Deter	mination				Speed D)etel	rminatio	n		
M _S = 0.211 (Ex	ibit 13-11)				D _s = (E	xhibit	13-12)			
S _R = 64.1 mph	(Exhibit 13-11)				S _R = mp	oh (Ex	hibit 13-12)			
S ₀ = N/A mph (Exhibit 13-11) S ₀ = mph (Exhibit 13-12)										
S = 64.1 mph (Exhibit 13-13) S = mph (Exhibit 13-13)										

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	RAMPS AND RAMP JUNCTIONS WORKSHEET									
General Info	rmation			Site Infor	mation					
Analyst			Fr	eeway/Dir of Tr	avel	I-95 SB	Express L	ane		
Agency or Company	AEC	OM	Ju	Inction	(Off to S	SW 10th Co	nnector		
Date Performed	d DM		JU Ar	risdiction Voar		2020 B	uild 2			
Project Description	SW 10th Stree	t SIMR		arysis real		2020 D				
Inputs										
	Domn	Freeway Nun	nber of Lanes, N	2					Downotroor	n Adi
Upsilealli Auj P	tainp	Ramp Numbe	er of Lanes, N	1				F	Ramp	li Auj
Yes	On	Acceleration	Lane Length, L							
	O #	Deceleration	Lane Length L	250						
		Freeway Volu	Ime, V _E	1730					l≪ No	Off
L _{up} =	ft	Ramp Volum	e, V _P	560				l	-down =	ft
		Freeway Free	e-Flow Speed, S	70.0						
$V_u = v$	/eh/h	Ramp Free-F	low Speed, SED	60.0					v _D =	ven/n
Conversion t	to pc/h Un	der Base	Conditions							
(nc/h)	V	PHF	Terrain	%Truck	%Rv		f	f	v = V/PHE	fxf
	(Veh/hr)	0.05		70TTUCK	/0100		'HV	'p		· 'HV ^ 'p
Freeway	1/30	0.95	Level	3	0	0.	985	1.00	184	8
Railip UnStream	000	0.95	Level	2	0	0.	990	1.00	593)
DownStream						+				
		Merge Areas					D	iverge Areas		
Estimation o	f v ₁₂				Estimati	ion o	f v ₁₂			
	$V_{12} = V_{F}$	(P _{FM})					V ₁₂ =	V _R + (V _F - V _R)P _{FD}	
L _{FO} =	(Equa	ation 13-6 or	⁻ 13-7)		L _{FO} =		 (E	Equation 13-12	2 or 13-13)	
P _{FM} =	using	Equation (Exhibit 13-6)		P _{FD} =		1.0	00 using Equ	ation (Exhibi	t 13-7)
V ₁₂ =	pc/h				V ₁₂ =		18	48 pc/h		
V_3 or V_{av34}	pc/h (Equation 13	8-14 or 13-17)		V_3 or V_{av34}		0	pc/h (Equation	n 13-14 or	13-17)
Is V_3 or $V_{av34} > 2,70$	00 pc/h? 🗌 Ye	s 🗌 No			Is V_3 or V_{av3}	₄ > 2,7	00 pc/h? 🗌	Yes 🗹 No		·
Is V_3 or $V_{av34} > 1.5$	* V ₁₂ /2 Ye	s 🗌 No			Is V_3 or V_{av3}	₄ > 1.5	* V ₁₂ /2	Yes 🗹 No		
If Yes,V ₁₂₆ =	pc/h (Equation 13	8-16, 13-18, or		If Yes, V ₁₀ =		p	c/h (Equation	13-16, 13-1	8, or 13-
Canacity Ch	13-19))			Conceit	v Ch	19	9)		
	Actual		2 anacity				Actual	Car	ocity	
	Actual		Japacity	LUSF?	V		1010	Evhibit 13-8	1800	LUS F ?
V		Evhibit 12.0			V = V	V	1040	Exhibit 12.0	4000	No
v FO		EXHIDIL 13-8			$v_{FO} - v_F$	- v _R	1253	EXTIDIL 13-8	4800	INO
			-		V _R		595	Exhibit 13-10	2200	No
Flow Enterin	g Merge Ir	fluence A	Area	N/Islatise O	Flow En	terin	g Diver	ge Influend	e Area	Malakaro
V	Actual	IVIAX	Desirable	violation?	V	<i>F</i>		Every Land	e 4400-All	violation?
	ico Dotorr	EXTINUE 13-0	(if not E)				⁸⁴⁸		4400.All	
$D = 5.475 \pm 0$					Leveror		252 ± 0		<u>1 (11 1101 F</u>)
$D_{\rm R} = 5.475 \pm 0$	$100734 V_{R}^{+}$	0.0076 v ₁₂	- 0.00027 L _A		L D _ 17	_R – 4	·.202 + 0.	0000 v ₁₂ - 0.0		
$D_R = (pc/m/n)$	1)				$D_R = 1/$.9 (pc/	mi/in)			
	13-2)				LOS = B		oit 13-2)			
Speed Deter	mination				speea D	veter	minatio			
M _S = (Exibit 1	3-11)				$D_{s} = 0.1$	15/ (E:	xnidit 13-	12)		
S _R = mph (Exhibit 13-11)					S _R = 65	.6 mph	(Exhibit	13-12)		
S ₀ = mph (Ext	hibit 13-11)				⊃ ₀ = N//	A mph	(Exhibit 1	3-12)		
S = mph (Exhibit 13-13) S = 6						.6 mph	(Exhibit	13-13)		

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RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Infor	mation			Site Infor	mation					
Analyst			Fre	eeway/Dir of Tra	avel	I-95 S	B Express L	anes		
Agency or Company	AECO	MC	Ju	nction		On fro	m SW 10th	St. Connector		
Analysis Time Period	PM		Ju An	alvsis Year		2020	Build 2			
Project Description	SW 10th Street	SIMR					2011012			
Inputs										
Upstream Adi Ramp		Freeway Num	nber of Lanes, N	2					Downstrea	am Adi
		Ramp Numbe	er of Lanes, N	1					Ramp	,
Yes Or	l	Acceleration I	Lane Length, L _A	1100					∏Yes	On
✓ No Of	F	Deceleration	Lane Length L _D							
		Freeway Volu	ime, V _F	1170						
L _{up} = ft		Ramp Volume	e, V _R	80					L _{down} =	ft
V = veh/h		Freeway Free	e-Flow Speed, S _{FF}	70.0					V _D =	veh/h
°u ven/n		Ramp Free-F	low Speed, S _{FR}	60.0					D	
Conversion to	o pc/h Und	ler Base	Conditions		-					
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv		f _{HV}	f _p	v = V/PHF	x f _{HV} x f _p
Freeway	1170	0.95	Level	3	0	0	.985	1.00	1	250
Ramp	80	0.95	Level	2	0	0	.990	1.00		85
UpStream										
DownStream								·		
Estimation of	TV I	vierge Areas			Fstimati	ion	D Df V	iverge Areas		
	* 12	(5)			LSumau		<u>12</u>			
	$V_{12} = V_{F}$	(P _{FM})					V ₁₂ = V	/ _R + (V _F - V _F	_R)P _{FD}	
L _{EQ} =	(Equa	ation 13-6 o	r 13-7)		L _{EQ} =		(Equation 13	-12 or 13-1	3)
P _{FM} =	1.000	using Equa	tion (Exhibit 13-6)		P _{FD} =		L	ising Equatio	on (Exhibit 13	3-7)
$V_{12} =$	1250 p	bc/h			$V_{12} =$		p	oc/h		
v_3 or v_{av34}	0 pc/r	(Equation	13-14 or 13-17)		v_3 or v_{av34}] 		13-14 OF 13-1	1)
$15 V_3 01 V_{av34} > 2,70$		s ⊻No			$15 V_3 OI V_{av3}$	₃₄ > 2,	100 pc/11?	JYes ∐No		
$15 V_3 U V_{av34} > 1.5$	$v_{12}/2 \square Yes$	S ⊠N0 Fquation 1:	3-16 13-18 or		IS V ₃ OF V _{av3}	₃₄ > 1.:	o v ₁₂ /∠ ∟	⊥Yes ∟ No oc/b (Equatio	n 13-16 1	3-18 or
If Yes,V _{12a} =	13-19)		0 10, 10 10, 01		If Yes,V _{12a} =		13	8-19)	, in 10 10, it	0 10, 01
Capacity Che	cks				Capacit	y Ch	lecks			
	Actual	(Capacity	LOS F?	ļ		Actual	Ca	pacity	LOS F?
					V _F			Exhibit 13-	8	
V _{FO}	1335	Exhibit 13-8		No	V _{FO} = V _F	- V _R		Exhibit 13-	8	
					V _R			Exhibit 13	5-	
Flow Entering	n Merce In	fluence A	Irea		Flow En	terii	na Diver	rae Influei		
	Actual	Max	Desirable	Violation?		T	Actual	Max Des	irable	Violation?
V _{R12}	1485	Exhibit 13-8	4600:All	No	V ₁₂			Exhibit 13-8		
Level of Serv	ice Detern	nination (if not F)		Level of	Ser	vice De	terminatio	n (if not	F)
D _R = 5.475 +	0.00734 v _R + 0	.0078 V ₁₂ - 0.	00627 L _A		[) _R = 1	4.252 + 0.	0086 V ₁₂ - 0	.009 L _D	
D _R = 9.0 (pc/mi/	ln)				D _R = (p	c/mi/	ln)			
LOS = A (Exhibit	13-2)				LOS = (E	xhibi	t 13-2)			
Speed Detern	nination				Speed L)etel	rminatio	n		
M _s = 0.206 (Fxi	oit 13-11)				D _s = (E	xhibit	13-12)			
$S_{p} = 64.2 \text{ mph}$	Exhibit 13-11)				S _R = m	oh (Ex	hibit 13-12)			
$S_0 = N/A mph ($	Exhibit 13-11)				S ₀ = m	oh (Ex	hibit 13-12)			
S = 64.2 mph	Exhibit 13-13)				S = m	oh (Ex	hibit 13-13)			
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RAMPS AND RAMP JUNCTIONS WORKSHEET										
General Infor	mation			Site Inform	mation					
Analyst Agency or Company Date Performed	AECO	DM	Fre Ju	eeway/Dir of Tra nction risdiction	avel	I-95 N N. of H	B CD Hillsboro Blv	d		
Analysis Time Period	AM		An	alysis Year		2020 E	Build 2			
Project Description	SW 10th Street	SIMR								
Inputs										
Upstream Adj Ramp		Freeway Num Ramp Numbe	nber of Lanes, N er of Lanes, N	2 1					Downstrea Ramp	am Adj
Yes On		Acceleration I	Lane Length, L _A	890					□Yes	On
🗹 No 🛛 Off		Deceleration	Lane Length L _D	1000					✓ No	Off
L _{up} = ft		Freeway Volu Ramp Volume	ime, v _F e. Ve	1230 710					L _{down} =	ft
		Freeway Free	e-Flow Speed, S _{FF}	55.0					V =	veh/h
v _u = veh/h		Ramp Free-F	low Speed, S _{FR}	40.0					V _D –	VEII/II
Conversion to	o pc/h Und	ler Base	Conditions							
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv		f _{HV}	f _p	v = V/PHF	x f _{HV} x f _p
Freeway	1230	0.95	Level	3	0	0	.985	1.00	1	314
Ramp	710	0.95	Level	2	0	0	.990	1.00	7	/55
UpStream										
DownStream		Norgo Aroas					I	ivorgo Aroas		
Estimation of	Van	icige Areas			Estimati	ion d	of V ₄₀	iverge Areas		
	- 12 V V V						$\frac{12}{12}$			
	$v_{12} = v_F$	(r _{FM})	- 10 7)				v ₁₂ - v	R ⁺ (V _F - V _F	۲ ^۲ FD	2)
L _{EQ} –	(⊏qua		1 13-7)		EQ -		(Equation 13.	- 12 01 13-1	3) 7)
FFM -	1.000	using Equa	uon (Exhibit 13-6)		FD -		L	ising ⊑quatio		-/)
$v_{12} - v_{12} - v$	1314 0 ma/h)C/II	10 11 10 17)		$v_{12} - v_{12} - v$		۱	o/h (Equation)	10 11 or 10 1	7)
$v_3 \cup v_{av34}$	0 pc/r		13-14 01 13-17)		$v_3 \cup v_{av34}$	<u>`</u> 2'	l ⊒ 200 pc/b2		13-14 01 13-1	1)
$13V_3 \text{ or } V_{av34} > 2,700$	$V /2 \square V $				$13 V_3 O V_{av3}$	، 4 ~ 2, 1 1 ~	5 * V /2 □			
If Yes, $V_{12a} =$	pc/h (Equation 1	3-16, 13-18, or		If Yes, V _{12a} =	34 ~ 1	¹ 2′ ² □	c/h (Equatio	n 13-16, 13	3-18, or
Capacity Che	cks				Capacity	v Ch	ecks	5-13)		
	Actual	(Capacity	LOS F?			Actual	Са	pacity	LOS F?
			()		Vr			Exhibit 13-	8	
V _{EO}	2069	Exhibit 13-8		No	V _{FO} = V _F	- V _R		Exhibit 13-	8	
					V _R			Exhibit 13 10	-	
Flow Entering	n Merae In	fluence A	Area	.8	Flow En	terii	na Diver	ae Influer	nce Area	
Ĭ	Actual	Мах	Desirable	Violation?			Actual	Max Des	irable	Violation?
V _{R12}	2069	Exhibit 13-8	4600:All	No	V ₁₂			Exhibit 13-8		
Level of Servi	ice Detern	nination (ïf not F)		Level of	Ser	vice De	terminatic	n (if not	F)
D _R = 5.475 +	0.00734 v _R + C	0.0078 V ₁₂ - 0.	00627 L _A		[D _R = 4	4.252 + 0.	0086 V ₁₂ - 0	.009 L _D	
D _R = 15.7 (pc/mi	i/ln)				D _R = (p	c/mi/	ln)			
LOS = B (Exhibit 1	13-2)				LOS = (E	xhibi	t 13-2)			
Speed Detern	nination				Speed D)eter	rminatio	n		
M _S = 0.281 (Exit	oit 13-11)				D _s = (E	xhibit ⁻	13-12)			
S _R = 51.4 mph (Exhibit 13-11)				S _R = mp	oh (Ex	hibit 13-12)			
$S_0 = N/A mph (E)$	Exhibit 13-11)				S ₀ = mp	oh (Ex	hibit 13-12)			
$S_0^{=}$ N/A mph (Exhibit 13-11) S_0^{-} Input (Exhibit 13-12) $S =$ 51.4 mph (Exhibit 13-13) $S =$ mph (Exhibit 13-13)										

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	RAI	ORKSHE	ET							
General Infor	mation			Site Infor	mation					
Analyst Agency or Company Date Performed	AECO	MC	Fre Ju	eeway/Dir of Tra nction risdiction	avel	I-95 N N. of I	B CD Hillsboro Blvo	1.		
Analysis Time Period	d PM		An	alysis Year		2020 I	Build 2			
Project Description	SW 10th Stree	t SIMR								
Inputs									h	
Upstream Adj Ramp		Freeway Num Ramp Numbe	nber of Lanes, N er of Lanes, N	2 1					Downstrea Ramp	am Adj
Yes Or	ı	Acceleration I	Lane Length, L _A	890					Yes	On
🗹 No 🗌 Of	f	Deceleration	Lane Length L _D	1500					 ✓ No	Off
L _{up} = ft		Ramp Volume	e, V _E	1520 640					L _{down} =	ft
V = veh/h		Freeway Free	-Flow Speed, S _{FF}	55.0					V _D =	veh/h
vu venn	I	Ramp Free-F	low Speed, S _{FR}	40.0					D	•
Conversion t	o pc/h Und	der Base	Conditions							
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv		$f_{\rm HV}$	f _p	v = V/PHF	$ m x~f_{HV}~x~f_{p}$
Freeway	1520	0.95	Level	3	0	0	.985	1.00	1	624
Ramp	640	0.95	Level	2	0	0	.990	1.00	6	080
UpStream						_				
DownStream	<u> </u>	Morgo Aroac					<u> </u>	ivorgo Aroac		
Estimation of	fv.	Merge Areas			Fstimati	ion d	of V.	iverge Areas		
	12	(D)			Loumaa		<u> </u>	/ . /\/ \/	<u>\</u> D	
	$v_{12} = v_F$	(P _{FM})					v ₁₂ = (/ _R + (v _F - v _R	P _{FD}	2)
L _{EQ} =	(Equa	ation 13-6 o	r 13-7)		L _{EQ} =		(Equation 13-	12 or 13-1	3)
P _{FM} =	1.000	using Equa	tion (Exhibit 13-6)		P _{FD} =		U	sing Equatio	n (Exhibit 13	-/)
V ₁₂ =	1624	pc/h			V ₁₂ =		p	c/h		
V_3 or V_{av34}	0 pc/ł	n (Equation	13-14 or 13-17)		v_3 or v_{av34}		۲ ۵۰۰ ۳۰۰	c/h (Equation 1	3-14 or 13-1	/)
IS V_3 or $V_{av34} > 2,70$)U pc/n? []Ye	s ⊠No			IS V_3 or V_{av3}	₃₄ > 2,				
IS V_3 or $V_{av34} > 1.5$	"V ₁₂ /2 ∐Yes	s ⊠No (Equation 1'	2 16 12 19 or		IS V_3 or V_{av3}	₈₄ > 1.9	o V ₁₂ /2 ∟	JYes ∐No	n 10 16 10	10 or
If Yes,V _{12a} =	13-19)		5-10, 15-10, 01		If Yes,V _{12a} =		13	ic/ii (⊏qualio i-19)	11 13-10, 13	5-10, UI
Capacity Che	ecks				Capacity	y Ch	ecks	1		
	Actual	(Capacity	LOS F?			Actual	Са	pacity	LOS F?
					V _F			Exhibit 13-	8	
V _{FO}	2304	Exhibit 13-8		No	$V_{FO} = V_{F}$	- V _R		Exhibit 13-	8	
					V _R			Exhibit 13 10	-	
Flow Entering	g Merge In	fluence A	Area	-	Flow En	terii	ng Diver	ge Influer	ice Area	
	Actual	Max	Desirable	Violation?			Actual	Max Des	irable	Violation?
V _{R12}	2304	Exhibit 13-8	4600:All	No	V ₁₂			Exhibit 13-8		
Level of Serv	rice Detern	nination (ïf not F)		Level of	Ser	vice De	terminatio	n (if not	F)
D _R = 5.475 +	0.00734 v _R + 0).0078 V ₁₂ - 0.	00627 L _A		[[D _R = -	4.252 + 0.	0086 V ₁₂ - 0	.009 L _D	
D _R = 17.6 (pc/m	ni/ln)				D _R = (p	c/mi/	ln)			
LOS = B (Exhibit	13-2)				LOS = (E	xhibi	t 13-2)			
Speed Deterr	nination				Speed D)eter	rminatio	n		
$M_{c} = 0.289 (Fvi$	hit 13-11)				$D_s = (E)$	xhibit	13-12)			
$S_{n=} = 51.2 \text{ mnh}$	(Exhibit 12_11)				S _P = mu	oh (Ex	hibit 13-12)			
$S_{R} = N/A mph/$	Evhihit 12 11)				$S_0 = mr$	oh (Ex	, hibit 13-12)			
S = 51.2 mph	(Exhibit 13-13)				S = mr	oh (Fv	hibit 13-13)			
S = 51.2 mph (Exhibit 13-13) S = mph (Exhibit 13-13)										

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