Genera	I Informati		REEWAY	***	Site Info		-			
Genera	ii iiiiOiiiiati	011			Oite iiiio	mation				
Analyst Agency/Co Date Perfo Analysis Ti	rmed	AECO!	М		Freeway/Dir of Travel Weaving Segment Location Analysis Year I-95 NB Seg 1-Bet Copans & Sample 2020 Build 1					
_										
Project Des Inputs	scription SW 10t	h Street SIMF	₹							
					1					
	onfiguration			One-Sided	Segment typ	е			Freewa	
	umber of lanes, N egment length, L			4 2380ft	Freeway min	nimum speed	, S _{MIN}		1	
	ee-flow speed, Fl	•		70 mph	Freeway ma:	ximum capac	city, C _{IFL}		240	
	•			•	Terrain type				Leve	
Conver	sions to po		1	1	1					
	V (veh/h)	PHF	Truck (%)	RV (%)	Ε _Τ	E _R	f_{HV}	fp	v (pc/h)	
V_{FF}	4435	0.95	3	0	1.5	1.2	0.985	1.00	4738	
V_{RF}	345	0.92	2	0	1.5	1.2	0.990	1.00	379	
V_{FR}	810	0.92	2	0	1.5	1.2	0.990	1.00	889	
V_{RR}	0	0.95	0	0	1.5	1.2	1.000	1.00	0	
V_{NW}	4738							V =	6006	
V_W	1268									
VR	0.211									
Config	uration Cha	aracteris	tics							
Minimum r	naneuver lanes, l	N_{WL}		2 lc	Minimum weaving lane changes, LC _{MIN} 12					
Interchang	e density, ID			0.7 int/mi	Weaving lane changes, LC _W 17					
Minimum F	RF lane changes,	LC_{RF}		1 lc/pc	Non-weaving	g lane chang	es, LC _{NW}		1496 lc/h	
Minimum F	R lane changes,	LC_FR		1 lc/pc	Total lane ch	nanges, LC _{AL}	L		3199 lc/h	
Minimum F	RR lane changes	, LC _{RR}		lc/pc	Non-weaving	g vehicle inde	ex, I _{NW}		789	
Weavir	ig Segment	t Speed,	Density, I	_evel of	Service,	and Cap	oacity			
Weaving s	egment flow rate	, V		5924 veh/h	_	ensity factor,			0.285	
Weaving s	egment capacity,	C _w		8772 veh/h		gment speed			54.5 mpl	
Weaving segment v/c ratio 0.675					Average wea	57.8 mpł				
Weaving segment density, D 27.6 pc/mi/ln									53.7 mpł	
	ervice, LOS			С	Maximum weaving length, L _{MAX} 4650					
Notes			-td				d -d:	:: 0	di	
Chapter 13,	segments longer to "Freeway Merge a	and Diverge Se	egments".	_		solated merge	and diverge ar	eas using the	procedures of	
	nes that exceed the			ne level of ser		10 TM Version			erated: 5/22/20	

Copyright © 2016 University of Florida, All Rights Reserved

HCS 2010TM Version 6.90 Generated: 5/22/2019 2:32 PM

	BASIC I	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst			Highway/Direction of Travel	I-95 NB	
Agency or Company	AECOM		From/To		et On & On from
Date Performed			Jurisdiction	Sample	
Analysis Time Period	AM		Analysis Year	2020 Bu	ild 1
Project Description SW 10th	Street SIMR				
✓ Oper.(LOS)			Des.(N)	□Pla	nning Data
Flow Inputs					
Volume, V	4780	veh/h	Peak-Hour Factor, PHF	0.95	
AADT		veh/day	%Trucks and Buses, P _T	3	
Peak-Hr Prop. of AADT, K			%RVs, P _R	0	
Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	General Terrain: Grade % Length	Level mi	
DDITY TVIDIXICAD		VCHITT	Up/Down %	1111	
Calculate Flow Adjustn	nents		·		
f _p	1.00		E _R	1.2	
E _T	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
 Speed Inputs			Calc Speed Adj and FF		
•		ft	Caro opoda 7 taj ana 1 1	<u> </u>	
Lane Width Rt-Side Lat. Clearance		IL ft	f		mph
Number of Lanes, N	3	π	f _{LW}		mph
Total Ramp Density, TRD	3	ramps/mi	f _{LC} TRD Adjustment		•
FFS (measured)	70.0	ramps/mi		70.0	mph
,	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			
LOS and Performance	Measures		Design (N)		
Operational (LOS)			Design (N)		
v _p = (V or DDHV) / (PHF x N)	(f xf)1702	pc/h/ln	Design LOS		
r		•	$v_p = (V \text{ or DDHV}) / (PHF x N x)$	$(f_{HV} \times f_p)$	pc/h/ln
S D-v/S	67.1 25.4	mph	S		mph
D = v _p / S LOS	25.4 C	pc/mi/ln	$D = v_p / S$		pc/mi/ln
LOS	C		Required Number of Lanes, N	I	
Glossary			Factor Location		
N - Number of lanes	S - Speed				
V - Hourly volume	D - Density		E _R - Exhibits 11-10, 11-12	40	f _{LW} - Exhibit 11-8
v _n - Flow rate	FFS - Free-flow	/ speed	E _T - Exhibits 11-10, 11-11, 11	-13	f _{LC} - Exhibit 11-9
LOS - Level of service	BFFS - Base fr	-	f _p - Page 11-18	.	TRD - Page 11-1
DDHV - Directional design ho		•	LOS, S, FFS, v _p - Exhibits 11-	·2, 11-3	
Copyright © 2016 University of Florida,			HCS 2010 TM Version 6.90	-	enerated: 5/22/2019 2:

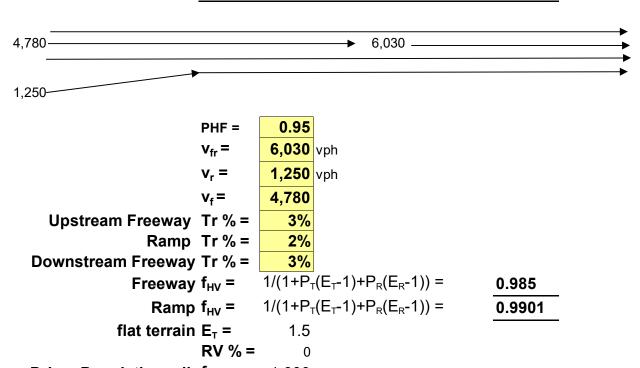
Job: SW 10th Street SIMR

Analyst: AECOM

Location: Seg 3: I-95 Northbound On-Ramp from WB Sample Road

Analysis Period: AM Peak Hour

Analysis Year: 2020 Build 1



Driver Population adj. $f_P = 1.000$ $V_{fr} = = v_{fr}/(PHF)(f_{HV})(f_P) = 1.000$

 $\mathbf{V_f} = \begin{array}{c} \mathbf{V_{f'}}(\mathsf{PHF})(\mathsf{f_{HV}})(\mathsf{f_P}) = \\ = \mathbf{V_{f'}}(\mathsf{PHF})(\mathsf{f_{HV}})(\mathsf{f_P}) = \\ \end{array}$

6,443	pc/h	
1,329	pc/h	
5,107	pc/h	

No. lanes upstream of ramp N = 3

No. Ln	Capacity Check (see Exhibits 25-3 and 25-7):	Maximum	Actual	V/c	LOS F?
4	Fwy downstream of ramp (assume 70 mph free-flow speed) =	9,600	6,443	0.67	No
3	Fwy upstream of ramp (assume 70 mph free-flow speed) =	7,200	5,107	0.71	No
1	Capacity on On-Ramp (assume 45 mph free-flow speed) =	2,100	1,329	0.63	No

	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	AECOM AM		Highway/Direction of Travel From/To Jurisdiction Analysis Year	I-95 NB Seg 4-Be Exp 2020 Buil	t On from Sample &
Project Description SW 10th			7 that your Tour	Zozo Ban	<u>u , </u>
✓ Oper.(LOS)			Des.(N)	□Plar	ning Data
Flow Inputs					9 = 0.00
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D	6030	veh/h veh/day veh/h	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade 0.00% Length Up/Down %	0.95 3 0 Grade 0.00mi 0.00	
Calculate Flow Adjustn	nents				
f _p E _T	1.00 1.5		E_R $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	1.2 0.985	
Speed Inputs			Calc Speed Adj and FFS	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	r	Design (N)		
Operational (LOS) v _p = (V or DDHV) / (PHF x N x) S D = v _p / S LOS		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 freeur volume	-	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

HCS 2010TM Version 6.90

Generated: 5/22/2019 3:07 PM

		RA	MPS AND	RAMP JUN	CTIONS W	/ORKSH	EET				
General	Infor				Site Infor						
Analyst				Fi	reeway/Dir of Tr		I-95 N	IB			
Agency or C	ompany	AEC	OM		unction			i-On from Ex	(p		
Date Perforn				Ju	urisdiction		5		r		
Analysis Tim	ne Period	l AM		A	nalysis Year		2020	Build 1			
Project Desc	cription	SW 10th Stree	et SIMR								
Inputs											
Upstream Ad	di Ramp		Freeway Num	ber of Lanes, N	4					Downstre	eam Adi
	-, · · · · · · · · · · · · · · · · · · ·		Ramp Numbe	er of Lanes, N	1					Ramp	
☐ Yes	On	l	Acceleration I	_ane Length, L _Δ	1500					✓ Yes	☐ On
		_	1	Lane Length L _D							
✓ No	Off	İ	Freeway Volu	- 5	6030					☐ No	✓ Off
<u> </u>	ft		1	•						L _{down} =	6200 ft
L _{up} =	11		Ramp Volume	11	890					-down	0200 11
V _u =	veh/h		1	e-Flow Speed, S _{FF}	70.0					V _D =	1070 veh/h
u			Ramp Free-F	low Speed, S _{FR}	50.0						
Convers	sion to	pc/h Un	der Base	Conditions							
(pc/h	1)	(\/ab/b=\	PHF	Terrain	%Truck	%Rv		f _{HV}	fp	v = V/PH	F x f _{HV} x f _p
		(Veh/hr) 6030	 			0	+		1.00		6443
Freeway			0.95	Level	3	 	_	0.985			
Ramp UpStream		890	0.92	Level	2	0	+	0.990	1.00	+	977
DownStream	n	1070	0.92	Level	2	0	+ ,	0.990	1.00	+	1175
Downstiear	11		Merge Areas	Level		0			Diverge Areas		1173
Estimati	ion of		merge / treue			Estimat	ion	of v ₄₂	71701 go 711 cuc	<u> </u>	
		V ₁₂ = V _F	/ D \					12			
_			• •••	. 40. 7)				$V_{12} = 1$	V _R + (V _F - V	′ _R)P _{FD}	
L _{EQ} =			ation 13-6 o	•		L _{EQ} =			(Equation 1	3-12 or 13-	13)
P _{FM} =				tion (Exhibit 13-6))	P _{FD} =		1	using Equat	ion (Exhibit 1	13-7)
V ₁₂ =		616 p				V ₁₂ =			oc/h		
V ₃ or V _{av34}			pc/h (Equati	on 13-14 or 13-	•	V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17)					
	> 2 70	17) 0 pc/h? ☑ Ye	o 🗆 No			Is V_3 or $V_{av34} > 2,700$ pc/h? \square Yes \square No					
						Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ Yes \square No					
		V ₁₂ /2		40 40 40		no/h /Faccation 10 10 10 an					
If Yes,V _{12a} =			pc/n (Equati 13-19)	on 13-16, 13-		If Yes,V _{12a} =	=		3-19)		, -
Capacity	v Che		10 10)			Capacit	v Cł	necks			
	,	Actual		Capacity	LOS F?		,	Actual		apacity	LOS F?
				- Pro- G		V _F			Exhibit 1		
.,		7400	E 1 " " 40 0		l	$V_{FO} = V_{F}$	- V_		Exhibit 1		
V _{FC})	7420	Exhibit 13-8		No		*R		Exhibit 1		_
						V_R			10	3-	
Flow En	terino	Merge In	fluence A	rea		Flow En	teri	ng Dive	rge Influe	nce Area	3
		Actual	Ú.	Desirable	Violation?			Actual	Max De		Violation?
V _{R12}	2	3863	Exhibit 13-8	4600:All	No	V ₁₂			Exhibit 13-8		
		ice Detern		if not F)			Sei	vice De	terminati		t F)
						1				•	•
$D_R = 5.475 + 0.00734 \text{ v}_R + 0.0078 \text{ V}_{12} - 0.00627 \text{ L}_A$ $D_R = 27.4 \text{ (pc/mi/ln)}$						$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R = (pc/mi/ln)$					
LOS = C (Exhibit 13-2)								it 13-2)			
	`					<u> </u>			<u> </u>		
Speed D						Speed L			ภา		
ľ		oit 13-11)						13-12)			
S _R = 60).0 mph (Exhibit 13-11)				1.		(hibit 13-12)			
, ·	5.8 mph (Exhibit 13-11)				S ₀ = mph (Exhibit 13-12)					
S = 62	2.6 mph (Exhibit 13-13)				S = m	ph (Ex	(hibit 13-13)			
sht @ 2016 Un											stad: E/22/2010

Generated: 5/22/2019 3:20 PM

	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed	AECOM		Highway/Direction of Travel From/To Jurisdiction	I-95 NB Seg 6-B	et Exp On & Off to 10th
Analysis Time Period	AM		Analysis Year	2020 Bu	ild 1
Project Description SW 10t	th Street SIMR				
✓ Oper.(LOS))		Des.(N)	□Pla	inning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K	6920	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R	0.95 3 0	
Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	General Terrain: Grade % Length Up/Down %	Level mi	
Calculate Flow Adjusti	ments				
f_p	1.00		E _R	1.2	
E _T	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
Speed Inputs			Calc Speed Adj and FFS	3	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	3		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			
LOS and Performance	Measures		Design (N)		
Operational (LOS) v _p = (V or DDHV) / (PHF x N S D = v _p / S	x f _{HV} x f _p) 2464 51.5 47.9	pc/h/ln mph pc/mi/ln	Design (N) Design LOS v _p = (V or DDHV) / (PHF x N x S D = v _p / S	$f_{HV} \times f_p)$	pc/h/ln mph pc/mi/ln
LOS	F		Required Number of Lanes, N		po
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base freedour volume	-	E_R - Exhibits 11-10, 11-12 E_T - Exhibits 11-10, 11-11, 11- f_p - Page 11-18 LOS, S, FFS, v_p - Exhibits 11-2		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

HCS 2010TM Version 6.90

Generated: 5/22/2019 3:28 PM

Location:	Seg 7: I-9	95 NB Off-Ramp to SW 10t	h St EB & WB	_	
Analysis Period:	AM Peak	Hour		_	
Analysis Year:	2020 Bui	ld 1		_	
	-	6,920			5,850
					▶
				L	
		0.05		1,070	
	PHF =	0.95			
	$v_{fr} =$	6,920 vph			
	$v_r =$	1,070 vph			
	v _f =	5,850			
Upstream Freeway		3%			
•	Tr % =	2%			
Downstream Freeway			\\ -	0.005	
		$1/(1+P_T(E_T-1)+P_R(E_R-1)$	-	0.985	_
		$1/(1+P_T(E_T-1)+P_R(E_R-1))$)) =	0.990099	-
flat terrain	E _T = RV % =	1.5			
Driver Benulation adi		•			
Driver Population adj.	-	1.000	7.000		1
		$=v_{fr}/(PHF)(f_{HV})(f_P) =$	7,393	pc/h	
	-	$=v_r/(PHF)(f_{HV})(f_P) =$	1,138	pc/h	
	=	$=v_f/(PHF)(f_{HV})(f_P) =$	6,250	pc/h	
lo. lanes upstream of ramp	N =	4			
Average Freeway D	oneity l	Jpstream of Diverge (s	oo Equation	13-26\-	
Average i reeway b	ensity C	potream of Diverge (s	ee Equation	<u> 13-20).</u>	
$D = 0.0175 (V_{fr}/N) =$	32.3	pc/ln			
LOS in the Diverge	Area (fr	om Density and Exhib	it 13-2) =		
Ln Capacity Check (se	e Fyhih	its 13-2 13-8 and 13 1	0) Maximum	Actual	LOS
-			9,600		
Fwy upstream of ramp (a	155ume / U	, IIIDII II 66-110M 2D6601 —			
<i>y</i> 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	o (assume	70 mph free-flow speed) =	7,200 2,100	6,250	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 NB Seg 8-B	et Off & Off Ramps
Analysis Time Period	AM		Analysis Year	2020 Bu	ild 1
Project Description SW 10to					
✓ Oper.(LOS)			Des.(N)	Pla	anning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K	5850	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R	0.95 3 0	
Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	General Terrain: Grade % Length Up/Down %	Level mi	
Calculate Flow Adjustr	nents				
f_p	1.00		E _R	1.2	
E _T	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
Speed Inputs			Calc Speed Adj and FFS	3	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_LW		mph
Number of Lanes, N	3		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			
LOS and Performance	Measures		Design (N)		
Operational (LOS) v _p = (V or DDHV) / (PHF x N :	× f _{HV} × f _p) 2083	pc/h/ln	Design (N) Design LOS	f vfl	no/h/ln
S	61.0	mph	$v_p = (V \text{ or DDHV}) / (PHF x N x)$	'HV ^ 'p)	pc/h/ln mph
D = v _p / S	34.2	pc/mi/ln	S D = v _p / S		pc/mi/ln
LOS	D		Required Number of Lanes, N		рс/пі/п
Glossary			Factor Location		
N - Number of lanes	S - Speed				
V - Hourly volume	D - Density		E _R - Exhibits 11-10, 11-12		f _{LW} - Exhibit 11-8
v - Flow rate	FFS - Free-flow	speed	E _T - Exhibits 11-10, 11-11, 11-	13	f _{LC} - Exhibit 11-9
LOS - Level of service	BFFS - Base from	-	f _p - Page 11-18		TRD - Page 11-11
DDHV - Directional design ho		JO HOW SPECA	LOS, S, FFS, v _p - Exhibits 11-	2, 11-3	

HCS 2010TM Version 6.90

Generated: 5/22/2019 3:38 PM

		RAMP	S AND RAM	P JUNCTI	ONS WO	RKS	HEET				
General Info	ormation			Site Infor	mation						
Analyst				eeway/Dir of Tr		I-95 NE					
Agency or Compa Date Performed	ny AEC	COM		nction risdiction		Seg 9-	Off to Hillsh	oro EB&WB			
Analysis Time Per	iod AM			nalysis Year		2020 E	Build 1				
Project Description		et SIMR	,			2020 2	Junu 1				
nputs											
Upstream Adj	Ramn	Freeway Num	ber of Lanes, N	3					Downstre	eam ∆di	
opoli cum 7 taj	ramp	Ramp Numbe	r of Lanes, N	1					Ramp	zam zag	
☐Yes	On	Acceleration L	ane Length, L₄						✓ Yes	☑ On	
□ N₁-	□ o#		_ane Length L _D	200							
✓ No	Off	Freeway Volu	- 5	5850					☐ No	Off	
L _{up} =	ft	Ramp Volume	•	1310					L _{down} =	2800 ft	
ир			11								
V _u =	veh/h	-	-Flow Speed, S _{FF}	70.0					$V_D =$	1460 veh/h	
· ·	4 // 11		ow Speed, S _{FR}	45.0							
Conversion		der Base	Conditions	1	1	-		1			
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv		f_{HV}	f _p	v = V/PH	$F x f_{HV} x f_{p}$	
Freeway	5850	0.95	Level	3	0	0.	.985	1.00	6	5250	
Ramp	1310	0.92	Level	2	0		.990	1.00		438	
UpStream		1									
DownStream	1460	0.92	Level	2	0	0.	.990	1.00	1	603	
		Merge Areas						Diverge Areas			
Estimation	of v ₁₂				Estimat	ion c	of v ₁₂				
	V ₁₂ = V _F	(P _{EM})					V ₁₂ =	V _R + (V _F - V _F)P _{ED}		
- _{EQ} =		ation 13-6 or	13-7)		L _{EQ} =			Equation 13-1		3)	
P _{FM} =		Equation (E	•		P _{FD} =		•	538 using Equ		•	
/ ₁₂ =	pc/h	, Equation (-XIIIDIC 10 0)		V ₁₂ =			000 using Eqc 025 pc/h	adion (Ex	more to 1)	
	•	/Equation 12	14 or 12 17)		V 12 V ₃ or V _{av34}			•	ation 12 d	14 05 12 17)	
/ ₃ or V _{av34}	-	•	-14 or 13-17)		V_3 or V_{av34} 2225 pc/h (Equation 13-14 or 13-17) Is V_3 or $V_{av34} > 2,700$ pc/h? \square Yes \checkmark No						
Is V_3 or $V_{av34} > 2$,					٠	•					
Is V_3 or $V_{av34} > 1$.			-16, 13-18, or					Yes ✓ No	12 16 1	2 10 or 12	
Yes,V _{12a} =	13-19		-10, 13-10, 01		If Yes,V _{12a} =	=	19	c/h (Equation 9)	13-10, 1	5-10, UI 13-	
Capacity Ch		,			Capacit	y Ch	ecks	,			
	Actual	C	apacity	LOS F?		_	Actual	Ca	pacity	LOS F?	
					V _F		6250	Exhibit 13-8	7200	No	
V_{FO}		Exhibit 13-8			V _{FO} = V _F		4812	Exhibit 13-8	7200	No	
FO					V _R		1438	Exhibit 13-10	+	_	
low Entori	na Maraa li	nfluonoo 1	l roo								
low Enteri	Actual		Desirable	Violation?	FIOW EI		Actual	rge Influend Max Desirab		Violation?	
V _{R12}	Actual	Exhibit 13-8	Desirable	violation:	V ₁₂	+	4025	Exhibit 13-8	4400:All	No	
Level of Sei	nice Deter		if not E)		·			terminatio			
					1					. <i>F)</i>	
D _R = 5.475 +	• • •	0.0076 V ₁₂ -	0.00027 L _A					.0086 V ₁₂ - 0.0	009 L _D		
) _R = (pc/mi/	•						:/mi/ln)				
OS = (Exhib	<u>_</u>						bit 13-2)				
Spood Doto	rmination				Speed $D_s = 0$.	Deter	minatio	n			
speed Dete	M _S = (Exibit 13-11)					.427 (E	xhibit 13-	·12)			
•	13-11)							40.40\			
M _S = (Exibit	•				$S_R = 58$	8.0 mpr	ı (Exhibit	13-12)			
$M_S = (Exibit)$ $S_R = mph(Exibit)$	xhibit 13-11)					-	n (Exhibit n (Exhibit	-			
$M_{\rm S}$ = (Exibit $S_{\rm R}$ = mph (Exibit) $S_{\rm O}$ = mph (Exibit)	•				$S_0 = 72$	2.0 mph	-	13-12)			

	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed	AECOM		Highway/Direction of Travel From/To Jurisdiction	I-95 NB Seg 10-	Bet Off & On Ramps
Analysis Time Period	AM		Analysis Year	2020 Bu	uild 1
Project Description SW 10t	th Street SIMR				
✓ Oper.(LOS))		Des.(N)	□Pla	anning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K	4540	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R	0.95 3 0	
Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	General Terrain: Grade % Length Up/Down %	Level mi	
Calculate Flow Adjustr	ments				
f _p	1.00		E _R	1.2	
É _T	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
Speed Inputs			Calc Speed Adj and FFS	6	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	3		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			
LOS and Performance	Measures		Design (N)		
Operational (LOS) v _p = (V or DDHV) / (PHF x N S D = v _p / S	x f _{HV} x f _p) 1617 68.0 23.8	pc/h/ln mph pc/mi/ln	Design (N) Design LOS v _p = (V or DDHV) / (PHF x N x S	$f_{HV} \times f_p$)	pc/h/ln mph
Los	С		D = v _p / S Required Number of Lanes, N		pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base freedour volume	-	E_R - Exhibits 11-10, 11-12 E_T - Exhibits 11-10, 11-11, 11- f_p - Page 11-18 LOS, S, FFS, v_p - Exhibits 11-2		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

HCS 2010TM Version 6.90

Generated: 5/22/2019 3:54 PM

	RAI	MPS AND	RAMP JUNG	CTIONS W	ORKSH	EET				
General Infor	mation			Site Infor	mation					
Analyst			Fre	eeway/Dir of Tr	avel	I-95 NE				
Agency or Company	AEC	ОМ	Jui	nction		Seg 11	-On Ramp 10	Oth St EB & W	ľΒ	
Date Performed				risdiction						
Analysis Time Period		LOUMB	An	alysis Year		2020 B	uild 1			
Project Description	SW 10th Stree	et SIMR								
Inputs		Fra access Nicoral	an aft anna N	•					Ì	
Upstream Adj Ramp		Ramp Number	per of Lanes, N	3 1					Downstrea Ramp	am Adj
✓ Yes □ On	ı	Acceleration L		1200					Yes	On
□ No ☑ Off	f	Deceleration L	ane Length L _D						☑ No	Off
		Freeway Volur		4540					_	
L _{up} = 2800	ft	Ramp Volume		1460					L _{down} –	ft
V _u = 1310 V	/eh/h	1	Flow Speed, S _{FF}	70.0					V _D =	veh/h
	//-	Ramp Free-Flo	110	50.0						
Conversion to	o pc/n Uno │			0/- :	2/5	1	, I			- , ,
(pc/h)	(Veh/hr)	PHF	Terrain	%Truck	%Rv		f _{HV}	f _p	v = V/PHF	x f _{HV} x f _p
Freeway	4540	0.95	Level	3	0		985	1.00		851
Ramp UpStream	1460 1310	0.92 0.92	Level	2	0		990 990	1.00		438
DownStream	1310	0.92	Level	2	0	0.	990	1.00	'	430
		Merge Areas	-					erge Areas		
Estimation of	^F V ₁₂				Estimat	ion o	f v ₁₂			
	V ₁₂ = V _F	(P _{FM})					V ₄₀ = V ₅	+ (V _F - V _R)P _{-D}	
L _{EQ} =	2126.96	6 (Equation	13-6 or 13-7)		L _{EQ} =			quation 13-		3)
P _{FM} =	0.611	using Equati	on (Exhibit 13-6)		P _{FD} =		-	ing Equatio		•
V ₁₂ =	2964	•			V ₁₂ =		рс			
V ₃ or V _{av34}	1887 1 7)	pc/h (Equatio	on 13-14 or 13-		V ₃ or V _{av34}		рс	/h (Equation 1	3-14 or 13-1	7)
Is V ₃ or V _{av34} > 2,70		s 🗹 No			Is V ₃ or V _{av}			Yes 🗌 No		
Is V ₃ or V _{av34} > 1.5 *					Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ Yes \square No					
If Yes,V _{12a} =			on 13-16, 13-		If Yes,V _{12a} =	=	рс 13-	/h (Equation	n 13-16, 1	3-18, or
.20		13-19)			Consoit	n. Ch		19)		
Capacity Che	Actual	1 0	apacity	LOS F?	Capacity Checks Actual Capacity LOS F					
	Actual		араску	LOOT:	V _F		Actual	Exhibit 13-8		LOO1:
V	6454	Exhibit 13-8		No	$V_{FO} = V_{F}$	- V _D		Exhibit 13-8		
V_{FO}	0404	EXHIBIT 19-0		INO	V _R	R		Exhibit 13		
		<u> </u>						10	<u> </u>	
Flow Entering			rea Desirable	Violation?	Flow Er		g Diverg Actual	Max Desi		
V _{R12}	Actual 4567	Exhibit 13-8	4600:All	No No	V ₁₂	+ '		Exhibit 13-8	iavie	Violation?
Level of Serv				140		f Serv		erminatio	n (if not	<i>F</i>)
		0.0078 V ₁₂ - 0.0						086 V ₁₂ - 0.		- /
D _R = 32.8 (pc/m		12	Λ		_	oc/mi/lr		12	D	
LOS = D (Exhibit	•					Exhibit	•			
Speed Detern	•						mination)		
M _S = 0.576 (Exil						Exhibit 1				
l -	(Exhibit 13-11)					ph (Exh	ibit 13-12)			
	(Exhibit 13-11)					ph (Exh	ibit 13-12)			
	Exhibit 13-13)				S = m	ph (Exh	ibit 13-13)			
						TM				

Generated: 5/22/2019 3:57 PM

	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed	AECOM		Highway/Direction of Travel From/To Jurisdiction	I-95 NB Seg 12-l	Bet On Ramps
Analysis Time Period	AM		Analysis Year	2020 Bu	ild 1
Project Description SW 10t	h Street SIMR				
✓ Oper.(LOS))		Des.(N)	Pla	anning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K	6000	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R	0.95 3 0	
Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	General Terrain: Grade % Length Up/Down %	Level mi	
Calculate Flow Adjustr	ments				
f_p	1.00		E _R	1.2	
É _T	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
Speed Inputs			Calc Speed Adj and FFS	6	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	3		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			
LOS and Performance	Measures		Design (N)		
Operational (LOS) $v_p = (V \text{ or DDHV}) / (PHF \times N)$ S $D = v_p / S$	x f _{HV} x f _p) 2137 59.8 35.7 <i>E</i>	pc/h/ln mph pc/mi/ln	Design (N) Design LOS v _p = (V or DDHV) / (PHF x N x S D = v _p / S	$f_{HV} \times f_p$)	pc/h/ln mph pc/mi/ln
LOS			Required Number of Lanes, N		
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base freedour volume	-	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

HCS 2010TM Version 6.90

Generated: 5/22/2019 4:00 PM

			REEWAY	WEAV	NG WOR	KKSHEE	l		
General	Informati	on			Site Info	rmation			
Analyst Agency/Con Date Perforr Analysis Tin	med	AECOI AM	V		Freeway/Dir of Travel I-95 NB Weaving Segment Location Seg 13-Bet On & Off to Exp Analysis Year 2020 Build 1				Off to Exp
Project Desc	cription SW 10t	th Street SIMF	₹		<u> </u>				
Inputs					-				
Weaving seg	mber of lanes, N gment length, L e-flow speed, F	s FS		4600ft 70 mph	Freeway max Terrain type	imum speed			Freeway 18 2400 Leve
Convers	sions to p	1	T						
	V (veh/h)	PHF	Truck (%)	RV (%)	E _T	E _R	f _{HV}	fp	v (pc/h)
V_{FF}	4765	0.95	3	0	1.5	1.2	0.985	1.00	5091
V_{RF}	1145	0.92	2	0	1.5	1.2	0.990	1.00	1257
V_{FR}	1235	0.92	2	0	1.5	1.2	0.990	1.00	1356
V_RR	125	0.92	2	0	1.5	1.2	0.990	1.00	137
V_{NW}	7704							V =	7841
V_{W}	137								
VR	0.017								
Configu	ration Cha	aracteris	tics						
Minimum m	aneuver lanes,	N_{WL}		0 lc		-	hanges, LC _{MIN}		411 lc/h
Interchange	-			0.7 int/mi	Weaving lan	ie changes, L	$-C_W$		1037 lc/h
	F lane changes	IN			Non-weaving		••••		3407 lc/h
	R lane changes	110		0 lc/pc	Total lane ch	nanges, LC _{AL}	L		4444 lc/h
Minimum R	R lane changes	, LC _{RR}		3 lc/pc	Non-weaving	g vehicle inde	ex, I _{NW}		2481
Weaving	g Segmen	t Speed,	Density, I	_evel of	1				
Weaving segment flow rate, v 7739 veh/h					Weaving inte	•			0.220
Weaving segment capacity, c _w 9068 veh/h									57.7 mph
Weaving segment v/c ratio 0.853 Weaving segment density, D 34.0 pc/mi/ln					Average weaving speed, S _W			60.1 mph	
vveaving se Level of Ser	•	D	34	4.0 pc/mi/in D	1111			57.6 mph	
revel of Sel	VICE, LOS			D	iviaximum w	eaving lengtr	ı, L _{MAX}		5889 ft

HCS 2010TM Version 6.90 Generated: 5/22/2019 4:06 PM

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

BASIC F	REEWAY SE	GMENTS WORKSHEET		
		Site Information		
AECOM		Highway/Direction of Travel From/To	I-95 NB Seg 14-I	North of Hillsboro
AM		Analysis Year	2020 Bu	ild 1
n Street SIMR				
		Des.(N)	∐Pla	nning Data
5910	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R	0.95 4 0	
	veh/h	General Terrain: Grade % Length Up/Down %	Level mi	
nents				
1.00		E _R	1.2	
1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.980	
		Calc Speed Adj and FFS	3	
	ft			
	ft	f_{LW}		mph
4		f_{LC}		mph
	ramps/mi	TRD Adjustment		mph
70.0	mph	FFS	70.0	mph
	mph			
Measures		Design (N)		
xfxf)1586	nc/h/ln	<u>Design (N)</u> Design LOS		
I.	•	P	$f_{HV} \times f_p$)	pc/h/ln
23.2	•	S		mph
С	•			pc/mi/ln
		·		
C Coord				
•		E _R - Exhibits 11-10, 11-12		f _{LW} - Exhibit 11-8
•	sneed	· .	13	f _{LC} - Exhibit 11-9
	-	f _p - Page 11-18		TRD - Page 11-1
ur volume	So-light speed	LOS, S, FFS, v _p - Exhibits 11-	2, 11-3	
	AECOM AM Street SIMR 5910 5910 nents 1.00 1.5 4 70.0 Measures (f _{HV} x f _p) 1586 68.3 23.2 C S - Speed D - Density FFS - Free-flow BFFS - Base free	AECOM AM 1 Street SIMR 5910 veh/h veh/day veh/h nents 1.00 1.5 ft ft ft 4 ramps/mi mph mph mph Measures Cf HV x fp) 1586 pc/h/ln 68.3 mph 23.2 pc/mi/ln C S - Speed D - Density FFS - Free-flow speed BFFS - Base free-flow speed	AECOM AM AM AN Street SIMR Des.(N) Peak-Hour Factor, PHF veh/day Weh/h veh/day Peak-Hour Factor, PHF Weh/day Wrucks and Buses, P _T %RVs, P _R General Terrain: Grade % Length Up/Down % Peak-Hour Factor, PHF White and Buses, P _T %RVs, P _R General Terrain: Grade % Length Up/Down % Peak-Hour Factor, PHF White and Buses, P _T %RVs, P _R General Terrain: Grade % Length Up/Down % Peak-Hour Factor, PHF White and Buses, P _T %RVs, P _R General Terrain: Grade % Length Up/Down % Peak-Hour Factor, PHF White and Buses, P _T %RVs, P _R General Terrain: Grade % Length Up/Down % Feator Speed Adj and FFS FFS Peage Adj and FFS FFS FFS Peage Adj and FFS FFS Peage Adj and FFS FFS FFS Peage Adj and FFS FFS FFS Peage Adj and FFS FFS FFS FFS FFS Peage Adj and FFS FFS FFS FFS FFS FFS FFS FFS	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$

HCS 2010TM Version 6.90

Generated: 5/22/2019 4:12 PM

			REEWAY	WEAV			<u> </u>		
Genera	l Informati	on			Site Info	rmation			
Analyst Agency/Co Date Perfo Analysis Ti	rmed	AECON PM	Л		Freeway/Dir of Travel I-95 NB Weaving Segment Location Seg 1-Bet Copans & Sample Analysis Year 2020 Build 1				& Sample
Project Des	scription SW 10t	h Street SIMF	?		1				
Inputs					•				
Weaving no Weaving se	onfiguration umber of lanes, N egment length, L ee-flow speed, Fl	3		One-Sided 4 2380ft 70 mph	Segment typo Freeway min Freeway max Terrain type	imum speed			Freeway 19 2400 Leve
Conver	sions to po	c/h Unde	r Base Co	ndition	S				
	V (veh/h)	PHF	Truck (%)	RV (%)	E _T	ER	f_{HV}	fp	v (pc/h)
V_{FF}	4400	0.95	3	0	1.5	1.2	0.985	1.00	4701
V_{RF}	410	0.92	2	0	1.5	1.2	0.990	1.00	450
V_{FR}	1570	0.92	2	0	1.5	1.2	0.990	1.00	1724
V_RR	0	0.95	0	0	1.5	1.2	1.000	1.00	0
V_{NW}	4701							V =	6875
V_W	2174								
VR	0.316								
Config	uration Cha	aracteris	tics						
Minimum r	naneuver lanes, l	N_{WL}		2 lc	Minimum we	aving lane c	hanges, LC _{MIN}		2174 lc/h
_	e density, ID			0.7 int/mi	Weaving lan	e changes, L	.C _w		2609 lc/h
	RF lane changes,	IM		1 lc/pc	Non-weaving	g lane chang	es, LC _{NW}		1488 lc/h
	R lane changes,	111		1 lc/pc	Total lane ch	nanges, LC _{AL}	L		4097 lc/h
Minimum F	RR lane changes	, LC _{RR}		lc/pc	Non-weaving	g vehicle inde	ex, I _{NW}		783
Weavin	ig Segment	t Speed,	Density, I	_evel of	Service,	and Cap	oacity		
Weaving segment flow rate, v 6784 veh/h				6784 veh/h	Weaving inte	•			0.347
_	egment capacity,	C _W		7478 veh/h	A				48.8 mph
Weaving segment v/c ratio 0.907					Average near weaving speed, S _W				55.8 mph
Weaving segment density, D 35.2 pc/mi/lr Level of Service, LOS E				•	Average non-weaving speed, S_{NW} Maximum weaving length, L_{MAX}				46.1 mph
Feaci Oi 26	ervice, LOS			E	Maximum we	eaving length	ı, L _{MAX}		5759 ft

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

	BASIC	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst			Highway/Direction of Travel	I-95 NB	
Agency or Company	AECOM		From/To		et On & On from
Date Performed			Jurisdiction	Sample	
Analysis Time Period	PM		Analysis Year	2020 Bu	ild 1
Project Description SW 10th	h Street SIMR				
✓ Oper.(LOS)			Des.(N)	☐ Pla	nning Data
Flow Inputs					
Volume, V	4810	veh/h	Peak-Hour Factor, PHF	0.95	
AADT		veh/day	%Trucks and Buses, P _T	3	
Peak-Hr Prop. of AADT, K			%RVs, P _R	0	
Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	General Terrain: Grade % Length	Level mi	
22V 70.01 X IX X		V ()	Up/Down %		
Calculate Flow Adjustn	nents		*		
f _p	1.00		E _R	1.2	
E _T	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
	7.0				
Speed Inputs			Calc Speed Adj and FFS	<u> </u>	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f _{LW}		mph
Number of Lanes, N	3		f _{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			
LOS and Performance	Measures		Design (N)		
0 (1400)			Design (N)		
Operational (LOS)	. f f. \ . -		Design LOS		
$v_p = (V \text{ or DDHV}) / (PHF x N)$	P	pc/h/ln	$v_p = (V \text{ or DDHV}) / (PHF x N x)$	$(f_{HV} \times f_n)$	pc/h/ln
S	66.9	mph	S	IIV P	mph
$D = v_p / S$	25.6	pc/mi/ln	$D = v_p / S$		pc/mi/ln
LOS	С		Required Number of Lanes, N		•
Glossary			Factor Location		
N - Number of lanes	S - Speed				
V - Hourly volume	D - Density		E _R - Exhibits 11-10, 11-12		f _{LW} - Exhibit 11-8
v _p - Flow rate	FFS - Free-flow	speed	E _T - Exhibits 11-10, 11-11, 11-	-13	f _{LC} - Exhibit 11-9
LOS - Level of service	BFFS - Base fr	-	f _p - Page 11-18		TRD - Page 11-1
DDHV - Directional design ho			LOS, S, FFS, v _p - Exhibits 11-	2, 11-3	
Copyright © 2016 University of Florida,			HCS 2010 TM Version 6.90		Senerated: 5/22/2019 2:

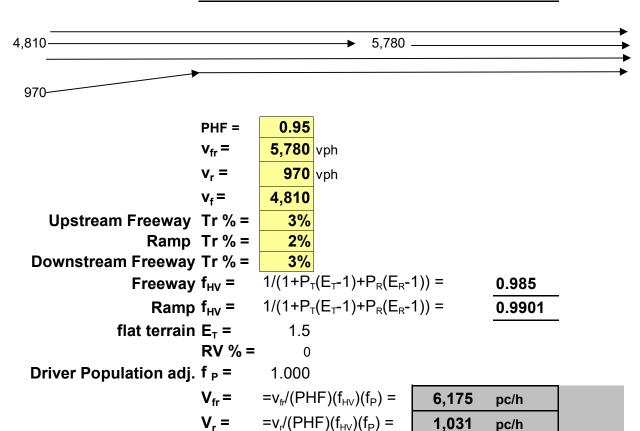
Job: SW 10th Street SIMR

Analyst: AECOM

Location: Seg 3: I-95 Northbound On-Ramp from WB Sample Road

Analysis Period: PM Peak Hour

Analysis Year: 2020 Build 1



No. Ln	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	6,175	0.64	No
3	Fwy upstream of ramp (assume 70 mph free-flow speed) =	7,200	5,139	0.71	No
1	Capacity on On-Ramp (assume 45 mph free-flow speed) =	2,100	1,031	0.49	No

 $=v_f/(PHF)(f_{HV})(f_P) =$

3

5,139

pc/h

 $V_f =$

No. lanes upstream of ramp N =

	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company AECOM Date Performed Analysis Time Period PM		Highway/Direction of Travel From/To Jurisdiction		I-95 NB Seg 4-Be Exp 2020 Bui	et On from Sample &
Project Description SW 10th	Street SIMR				
✓ Oper.(LOS)			Des.(N)	□Plaı	nning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D	5780	veh/h veh/day veh/h	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade 0.00% Length Up/Down %	0.95 3 0 Grade 0.00mi 0.00	
Calculate Flow Adjustm	nents		·		
f _p E _T	1.00 1.5		E_R $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	1.2 0.985	
Speed Inputs			Calc Speed Adj and FFS	3	
Lane Width		ft	January and Transferred		
Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD	4	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 I	Measures		Design (N)		
Operational (LOS) v _p = (V or DDHV) / (PHF x N x S D = v _p / S LOS	68.6 22.5 C	pc/h/ln mph pc/mi/ln	Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$ Required Number of Lanes, N	f _{HV} x f _p)	pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base fre ur volume	-	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

HCS 2010TM Version 6.90

Generated: 5/22/2019 3:12 PM

		RA	MPS AND	RAMP JUN	CTIONS W	ORKSHI	EET					
General	Infor				Site Infor							
Analyst				Fr	reeway/Dir of Tr		I-95 N	IB				
Agency or Co	ompany	AEC	OM		unction			i-On from Ex	(p			
Date Perform					urisdiction		Ū					
Analysis Time				Aı	nalysis Year		2020	Build 1				
	ription	SW 10th Stree	et SIMR									
Inputs										1		
Upstream Ad	lj Ramp		Freeway Num	nber of Lanes, N	4					Downstre	eam Adj	
			Ramp Numbe	er of Lanes, N	1					Ramp		
☐Yes	On		Acceleration I	Lane Length, L _A	1500					✓ Yes	☐ On	
✓ No	Off	:	Deceleration	Lane Length L _D							Off	
	0		Freeway Volu	ıme, V _F	5780)				□No	✓ Off	
L _{up} =	ft		Ramp Volume	•	730					L _{down} =	6200 ft	
		resimp resume, rR			70.0							
V _u =	$_{\rm u}$ = veh/h Ramp Free-Flow Speed, S _{FR} 50.0									$V_D =$	1300 veh/h	
Convora	ion to	- no/h I In		- 110	30.0							
Convers	ו ווסוו	y pc/n on		Conditions	1	1	- 1			1		
(pc/h))	(Veh/hr)	PHF	Terrain	%Truck	%Rv		f _{HV}	f_p	v = V/PH	$F x f_{HV} x f_{p}$	
Freeway		5780	0.95	Level	3	0	(0.985	1.00		6175	
Ramp		730	0.92	Level	2	0	_	0.990	1.00		801	
UpStream												
DownStream	n	1300	0.92	Level	2	0	(0.990	1.00		1427	
			Merge Areas						Diverge Areas	1		
Estimati	on of	v ₁₂				Estimat	ion	of v ₁₂				
		V ₁₂ = V _F	(P _{EM})					\/ - ·	\	(\D		
L _{EQ} =			ation 13-6 o	r 13-7)					V _R + (V _F - V		40)	
P _{FM} =				tion (Exhibit 13-6))	L _{EQ} =			(Equation 1		-	
V ₁₂ =		727 p		tion (Exhibit to 0))	P _{FD} =			using Equat	ion (Exhibit 1	13-7)	
				on 13-14 or 13-	_	V ₁₂ =			pc/h			
$ m V_3$ or $ m V_{av34}$		17)	po/ii (Equati	011 10-14 01 10-		V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17)						
Is V ₃ or V _{av3}	₄ > 2,700	0 pc/h? 🗹 Ye	s 🗌 No			Is V_3 or $V_{av34} > 2,700$ pc/h? \square Yes \square No						
		V ₁₂ /2 ☑ Ye				Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ Yes No						
				on 13-16, 13-		lf Yes V = pc/h (Equation 13-16, 13-18, or						
If Yes,V _{12a} =			13-19)	<u>, </u>					3-19)			
Capacity	/ Che	cks				Capacity Checks						
		Actual	(Capacity	LOS F?			Actual	С	apacity	LOS F?	
						V_{F}			Exhibit 1	3-8		
V_{FO}		6976	Exhibit 13-8		No	$V_{FO} = V_{F}$	- V _R		Exhibit 1	3-8		
FO	'					V _R			Exhibit 1	3-		
									10			
Flow En	tering		fluence A		1	Flow En	teri		rge Influe			
Actual Max Desirable Violation?							_	Actual	Max De		Violation?	
V _{R12}		3567	Exhibit 13-8	4600:All	No	V ₁₂ Exhibit 13-8						
			mination (4			terminati	•	t F)	
D _R =	5.475 +	0.00734 v _R +	0.0078 V ₁₂ - 0.	00627 L _A		D _R = 4.252 + 0.0086 V ₁₂ - 0.009 L _D						
D _R = 25	.1 (pc/mi	i/ln)				$D_R = (pc/mi/ln)$						
LOS = C((Exhibit	13-2)				LOS = (E	Exhib	it 13-2)				
Speed D	`					+			on			
•						Speed Determination D = (Evhibit 13.12)						
-	$M_{\rm S} = 0.309 (\text{Exibit 13-11})$							D _s = (Exhibit 13-12) S = mph (Exhibit 13-12)				
		Exhibit 13-11)				S_R = mph (Exhibit 13-12) S_0 = mph (Exhibit 13-12)						
ľ		Exhibit 13-11)				ľ						
		Exhibit 13-13)				S = m	pn (E)	(hibit 13-13)				
FT @ 0040 I I=		f Elorido All Dio				-	E			_	tod: E/22/2010	

Generated: 5/22/2019 3:22 PM

	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed	AECOM		Highway/Direction of Travel From/To Jurisdiction	I-95 NB Seg 6-B	et Exp On & Off to 10th
Analysis Time Period	PM		Analysis Year	2020 Bu	ild 1
Project Description SW 10	th Street SIMR				
✓ Oper.(LOS)		Des.(N)	□Pla	nning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K	6510	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R	0.95 3 0	
Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	General Terrain: Grade % Length Up/Down %	Level mi	
Calculate Flow Adjusti	ments				
f _p E _T	1.00 1.5		E_R $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	1.2 0.985	
Speed Inputs	7.0		Calc Speed Adj and FFS		
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_LW		mph
Number of Lanes, N	3		f _{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			
LOS and Performance	Measures		Design (N)		
Operational (LOS) v _p = (V or DDHV) / (PHF x N S D = v _p / S LOS	× f _{HV} × f _p) 2318 55.5 41.8 E	pc/h/ln mph pc/mi/ln	Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$ Required Number of Lanes, N	$f_{HV} \times f_p$)	pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base froour volume	-	E_R - Exhibits 11-10, 11-12 E_T - Exhibits 11-10, 11-11, 11- f_p - Page 11-18 LOS, S, FFS, v_p - Exhibits 11-2		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

HCS 2010TM Version 6.90

Generated: 5/22/2019 3:30 PM

Job: SW 10th Street SIMR Analyst: AECOM Location: Seg 7: I-95 NB Off-Ramp to SW 10th St EB & WB **Analysis Period: PM Peak Hour Analysis Year:** 2020 Build 1 5,210 6,510 1,300 0.95 PHF = **6,510** vph $v_{fr} =$ $v_r =$ **1,300** vph $V_f =$ 5,210 **Upstream Freeway Tr % =** 3% Ramp Tr % = 2% Downstream Freeway Tr % = 3% $1/(1+P_T(E_T-1)+P_R(E_R-1)) =$ 0.985 Freeway $f_{HV} =$ $1/(1+P_T(E_T-1)+P_R(E_R-1)) =$ 0.990099 Ramp $f_{HV} =$ flat terrain E_T = 1.5 RV % = 0 Driver Population adj. $f_P =$ 1.000 $V_{fr} = = V_{fr}/(PHF)(f_{HV})(f_P) =$ 6,955 pc/h $V_r = = V_r/(PHF)(f_{HV})(f_P) =$ 1,382 pc/h $V_f =$ $=v_f/(PHF)(f_{HV})(f_P) =$ 5,566 pc/h No. lanes upstream of ramp N =Average Freeway Density Upstream of Diverge (see Equation 13-26): $D = 0.0175 (V_{fr}/N) =$ 30.4 pc/ln LOS in the Diverge Area (from Density and Exhibit 13-2) = No. Ln Capacity Check (see Exhibits 13-2, 13-8 and 13.10) Maximum LOS F? Actual Fwy upstream of ramp (assume 70 mph free-flow speed) = 9.600 6,955 No Fwy downstream of ramp (assume 70 mph free-flow speed) = 3 7,200 5,566 No Capacity on Off-Ramp (assume 45 mph free-flow speed) = 2,100 1,382 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 NB Seg 8-B	et Off & Off Ramps
Analysis Time Period	PM		Analysis Year	2020 Bu	uild 1
Project Description SW 10th	h Street SIMR				
✓ Oper.(LOS)			Des.(N)	Pla	anning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K	5210	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R	0.95 3 0	
Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	General Terrain: Grade % Length Up/Down %	Level mi	
Calculate Flow Adjustr	nents				
f _p	1.00		E _R	1.2	
E _T	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
Speed Inputs			Calc Speed Adj and FFS	3	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_LW		mph
Number of Lanes, N	3		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			
LOS and Performance	Measures		Design (N)		
Operational (LOS) v _p = (V or DDHV) / (PHF x N x S	I.	pc/h/ln	Design (N) Design LOS v _p = (V or DDHV) / (PHF x N x	$f_{HV} \times f_p$)	pc/h/ln
	65.0 28.5	mph pc/mi/ln	S		mph
D = v _p / S LOS	26.5 D	рс/пп/п	$D = v_p / S$		pc/mi/ln
LOG	Б		Required Number of Lanes, N		
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base free	-	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

HCS 2010TM Version 6.90

Generated: 5/22/2019 3:39 PM

Freeway Volume, V _R 1310			RAMP	S AND RAM			RKS	HEET			
Agency or Company AECOM		rmation									
Date Performed	•				•						
Analysis Year 2020 Build 1		/ AEC	OM				Seg 9-	Off to Hillsh	oro EB&WB		
Project Description SW 10th Street SIMR		d PM					2020 F	Ruild 1			
Upstream Adj Ramp			et SIMR	7 11	laryolo i oai		2020 L	Juliu 1			
Yes	<u> </u>										
Acceleration Lane Length L _A	Upstream Adi F	Ramp	Freeway Nun	nber of Lanes, N	3					Downstre	am Adi
No	opoli odin 7 dj 1	(dilip	Ramp Numbe	er of Lanes, N	1						ani 7 taj
Deceleration Lane Length Lo Freeway Free-Flow Speed, S _{FF} 70.0 V _U = veh/h Freeway Free-Flow Speed, S _{FF} 70.0 V _D = 1160 V	□Yes	On	Acceleration	Lane Length, L _△						Vac	✓ On
Freeway Volume, V _F S210		□ O#	200								
Lup	₩ NO L			- 0	5210					∐ No	Off
Vu	L _{up} = f	ft	1	•						L _{down} =	2800 ft
Variable	up.			11							
Conversion to pc/h Under Base Conditions	$V_u = V$	/eh/h	-							V _D =	1160 veh/h
(pc/h)	Conversion 1	to nc/h Un		111	43.0						
Freeway \$5210 0.95 Level 3 0 0.985 1.00 5566					0/-	1 0/5	1		r		
Ramp	(pc/h)		PHF	I errain	% I ruck	%Rv		ſ _{HV}	т _р	v = V/PH	- х т _{НV} х т _р
DownStream 1160 0.92		5210	0.95	Level	3	0	0	.985	1.00	5	566
DownStream	•	1310	0.92	Level	2	0	0.	.990	1.00	1	438
Section Sect							+				
Estimation of v ₁₂	DownStream		1	Level	2	0	0.			1	273
V ₁₂ = V _F (P _{FM})	-stimation o		Merge Areas			Fstimat	ion c		olverge Areas		
			(D.)			Louman				\D	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$			• • • • • • • • • • • • • • • • • • • •								_,
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$				•				•	-		•
V ₃ or V _{av34} pc/h (Equation 13-14 or 13-17) V ₃ or V _{av34} 1838 pc/h (Equation 13-14 or 13-18) Is V ₃ or V _{av34} > 2,700 pc/h?		-	Equation (Exhibit 13-6)						uation (Exl	nibit 13-7)
$ S V_3 \text{ or } V_{av34} > 2,700 \text{ pc/h} \text{ Yes } \text{ No} \\ S V_3 \text{ or } V_{av34} > 1.5 \text{ * V}_{12} / 2 \text{ Yes } \text{ No} \\ S V_3 \text{ or } V_{av34} > 1.5 \text{ * V}_{12} / 2 \text{ Yes } \text{ No} \\ S V_3 \text{ or } V_{av34} > 1.5 \text{ * V}_{12} / 2 \text{ Yes } \text{ No} \\ S V_3 \text{ or } V_{av34} > 1.5 \text{ * V}_{12} / 2 \text{ Yes } \text{ No} \\ S V_3 \text{ or } V_{av34} > 1.5 \text{ * V}_{12} / 2 \text{ Yes } \text{ No} \\ S V_3 \text{ or } V_{av34} > 1.5 \text{ * V}_{12} / 2 \text{ Yes } \text{ No} \\ S V_3 \text{ or } V_{av34} > 1.5 \text{ * V}_{12} / 2 \text{ Yes } \text{ No} \\ S V_3 \text{ or } V_{av34} > 1.5 \text{ * V}_{12} / 2 \text{ Yes } \text{ No} \\ S V_3 \text{ or } V_{av34} > 1.5 \text{ * V}_{12} / 2 \text{ Yes } \text{ No} \\ S V_4 \text{ or } V_{av34} > 1.5 \text{ * V}_{12} / 2 \text{ Yes } \text{ No} \\ S V_4 \text{ or } V_{av34} > 1.5 \text{ * V}_{12} / 2 \text{ Yes } \text{ No} \\ S V_4 \text{ or } V_{av34} > 1.5 \text{ * V}_{12} / 2 \text{ Yes } \text{ No} \\ S V_4 \text{ or } V_{av34} > 1.5 \text{ * V}_{12} / 2 \text{ Yes } \text{ No} \\ S V_4 \text{ or } V_{av34} > 1.5 \text{ * V}_{12} / 2 \text{ Yes } \text{ No} \\ S V_4 \text{ or }		•							-		
$ S \vee_{3} \text{ or } \vee_{av34} > 1.5 * \vee_{12} / 2 $		•	•	3-14 or 13-17)						ation 13-1	4 or 13-17)
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$						* ***					
Tres, v _{12a}	Is V_3 or $V_{av34} > 1.5$					Is V ₃ or V _{av}	₃₄ > 1.5				
Capacity Checks Actual Capacity LOS F? Actual Capacity LOS F? V_F 5566 Exhibit 13-8 7200 $V_{FO} = V_F - V_R$ 4128 Exhibit 13-8 7200 V_R 1438 Exhibit 13-10 2100 Flow Entering Merge Influence Area Flow Entering Diverge Influence Area Actual Max Desirable Violation? Actual Max Desirable Violation? V_{R12} Exhibit 13-8 V12 3728 Exhibit 13-8 4400:All Nature of Service Determination (if not F) $D_R = 5.475 + 0.00734 V_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R = (pc/mi/ln)$ $D_R = 34.5 (pc/mi/ln)$	f Yes,V _{12a} =			3-16, 13-18, or		If Yes,V _{12a} =	=			13-16, 13	3-18, or 13-
Actual Capacity LOS F? Actual Capacity LOS F? Actual Capacity LOS F? Actual Capacity V _F 5566 Exhibit 13-8 7200 V _F 5566 Exhibit 13-8 7200 V _R 1438 Exhibit 13-8 7200 V _R 1438 Exhibit 13-10 2100 P _R 1438 Exhibit 13-8 P _R 1438 Exhibit 13-10 2100 P _R 1438 Exhibit 13-8 P _R 1438 Exhibit 13-10 P _R 1438 Exhibit 13-	Capacity Che)			Capacit	v Ch		<i>3)</i>		
$V_{FO} = V_F - V_R 4128 \text{Exhibit } 13-8 7200$ $V_R 1438 \text{Exhibit } 13-10 2100$ Flow Entering Merge Influence Area $Actual \text{Max Desirable} \text{Violation?} Actual \text{Max Desirable} \text{Viol}$ $V_{R12} \text{Exhibit } 13-8 V_{12} 3728 \text{Exhibit } 13-8 4400.\text{All} \text{N}$ $D_R = 5.475 + 0.00734 \text{ V}_R + 0.0078 \text{ V}_{12} - 0.00627 \text{ L}_A$ $P_R = \text{(pc/mi/ln)}$ $OS = \text{(Exhibit } 13-2)$ $OS = \text{(Exhibit } 13-2)$ $OS = \text{(Exhibit } 13-2)$ $OS = \text{Deed Determination}$ $OS = \text{Description } Descri$			(Capacity	LOS F?	1	,	1	Са	pacity	LOS F?
Flow Entering Merge Influence Area Actual Max Desirable Violation? V_{R12} Exhibit 13-8 Level of Service Determination (if not F) $D_R = 5.475 + 0.00734 \vee_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R = (pc/mi/ln)$ $D_R = 34.5 (pc/mi/ln)$ Speed Determination Speed Determination Speed Determination						V _F		5566	Exhibit 13-8	7200	No
Flow Entering Merge Influence Area Actual Max Desirable Violation? V_{R12} Exhibit 13-8 Level of Service Determination (if not F) $D_R = 5.475 + 0.00734 \vee_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R = (pc/mi/ln)$ $D_R = 34.5 (pc/mi/ln)$ Speed Determination Speed Determination Speed Determination	V_{EO}		Exhibit 13-8			$V_{EO} = V_{E}$	- V _P	4128	Exhibit 13-8	7200	No
Flow Entering Merge Influence Area Actual Max Desirable Violation? V _{R12} Exhibit 13-8 V ₁₂ 3728 Exhibit 13-8 4400:All N Level of Service Determination (if not F) $D_R = 5.475 + 0.00734 \text{ v}_R + 0.0078 \text{ V}_{12} - 0.00627 \text{ L}_A$ $D_R = (\text{pc/mi/ln})$ $D_R = 34.5 \text{ (pc/mi/ln})$	10										No
Actual Max Desirable Violation? Actual Max Desirable Violation? V ₁₂ 3728 Exhibit 13-8 4400:All N Level of Service Determination (if not F) $D_{R} = 5.475 + 0.00734 \text{ V}_{R} + 0.0078 \text{ V}_{12} - 0.00627 \text{ L}_{A}$ $D_{R} = \text{ (pc/mi/ln)}$ $D_{R} = 34.5 \text{ (pc/mi/ln)}$	Flow Enterin	a Morae Ir	ofluence /	1roa							
V_{R12} Exhibit 13-8 V_{12} 3728 Exhibit 13-8 4400:All N Level of Service Determination (if not F) Level of Service Determination (if not F) $D_R = 5.475 + 0.00734 \text{ v}_R + 0.0078 \text{ V}_{12} - 0.00627 \text{ L}_A$ $D_R = 4.252 + 0.0086 \text{ V}_{12} - 0.009 \text{ L}_D$ $D_R = (\text{pc/mi/ln})$ $D_R = 34.5 \text{ (pc/mi/ln})$ $D_R = 34.5 \text{ (pc/mi/ln})$ $D_R = 34.5 \text{ (pc/mi/ln})$ $D_R = 0.0086 \text{ V}_{12} - 0.009 \text{ L}_D$ $D_R = 0.009 \text{ L}_D$ $D_R = 0.0086 \text{ V}_{12} - 0.009 \text{ L}_D$ $D_R = 0.009 \text{ L}_D$ $D_R = 0.0086 \text{ V}_{12} - 0.009 \text{ L}_D$ $D_R = 0.009 \text{ L}_D$ $D_R = 0.0086 \text{ V}_{12} - 0.009 \text{ L}_D$ $D_R = 0.009 \text{ L}_D$ $D_R = 0.0086 \text{ V}_{12} - 0.009 \text{ L}_D$ $D_R = 0.009 \text{ L}_D$ $D_R = 0.0086 \text{ V}_{12} - 0.009 \text{ L}_D$ $D_R = 0.009 \text{ L}_D$ $D_R = 0.0086 \text{ V}_{12} - 0.009 \text{ L}_D$ $D_R = 0.009 \text{ L}_D$ $D_R = 0.0086 \text{ V}_{12} - 0.009 \text{ L}_D$ $D_R = 0.009 \text{ L}_D$ $D_R = 0.0086 \text{ V}_{12} - 0.009 \text{ L}_D$ $D_R = 0.009 \text{ L}_D$ $D_R = 0.0086 \text{ V}_{12} - 0.009 \text{ L}_D$ $D_R = 0.009 \text{ L}_D$ $D_R = 0.0086 \text{ L}_D$ $D_R = 0.009 \text{ L}_D$ <td>TOW Entering</td> <td></td> <td colspan="4"></td> <td></td> <td></td> <td></td> <td></td> <td>Violation?</td>	TOW Entering										Violation?
Level of Service Determination (if not F) Level of Service Determination (if not F) $D_R = 5.475 + 0.00734 \vee_R + 0.0078 \vee_{12} - 0.00627 \perp_A$ $D_R = 4.252 + 0.0086 \vee_{12} - 0.009 \perp_D$ $D_R = (pc/mi/ln)$ $D_R = 34.5 (pc/mi/ln)$ $D_R = 34.5 (pc/mi/ln)$ $D_R = 34.5 (pc/mi/ln)$ $D_R = 0.0086 \vee_{12} - 0.009	V _{P12}		Exhibit 13-8			V ₁₂		3728			No
$D_{R} = 5.475 + 0.00734 \text{ v}_{R} + 0.0078 \text{ V}_{12} - 0.00627 \text{ L}_{A}$ $D_{R} = 4.252 + 0.0086 \text{ V}_{12} - 0.009 \text{ L}_{D}$ $D_{R} = 34.5 \text{ (pc/mi/ln)}$		rice Deterr		(if not F)	<u> </u>				terminatio	n (if not	
$D_R = (pc/mi/ln)$ $D_R = 34.5 (pc/mi/ln)$ $D_R = 14.5 (pc/mi/ln)$ $D_R = 14.$			•			1				_ •	,
OS = (Exhibit 13-2) Speed Determination LOS = D (Exhibit 13-2) Speed Determination	• •	• •	12	^					12	Б	
Speed Determination Speed Determination	• •	•						•			
B	•										
// ₀ = (EXIDIT 13-17)						+					
	-						-		•		
							-	•	-		
S ₀ = mph (Exhibit 13-11) S ₀ = 73.5 mph (Exhibit 13-12)		•				ľ	-	•	•		
S = mph (Exhibit 13-13) S = 62.4 mph (Exhibit 13-13)	;= mph (Exh	nibit 13-13)]-		-	13-13)		
ight © 2016 University of Florida, All Rights Reserved HCS2010 TM Version 6.90 Generated: 5/22/20	ight © 2016 Universit	ty of Florida, All F	Rights Reserved			HCS2010 [™]	^M Versi	ion 6.90		Generated:	5/22/2019 3:5

	BASIC I	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed	AECOM		Highway/Direction of Travel From/To Jurisdiction	I-95 NB Seg 10-l	Bet Off & On Ramps
Analysis Time Period	PM		Analysis Year	2020 Bu	ild 1
Project Description SW 10	th Street SIMR				
✓ Oper.(LOS)		Des.(N)	Pla	nning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K	3900	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R	0.95 3 0	
Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	General Terrain: Grade % Length Up/Down %	Level mi	
Calculate Flow Adjust	ments				
f _p	1.00		E _R	1.2	
E _T	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
Speed Inputs			Calc Speed Adj and FFS	3	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	3		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS	3	mph			
LOS and Performance	Measures		Design (N)		
Operational (LOS) v _p = (V or DDHV) / (PHF x N	x f, x f) 1389	pc/h/ln	<u>Design (N)</u> Design LOS		
S	69.6	mph	$v_p = (V \text{ or DDHV}) / (PHF x N x)$	$f_{HV} \times f_p$)	pc/h/ln
D = v _p / S	20.0	pc/mi/ln	S		mph
LOS	C	ls =	D = v _p / S Required Number of Lanes, N		pc/mi/ln
Glossary			Factor Location		
	0 0		. actor Ecoution		
N - Number of lanes	S - Speed		E _R - Exhibits 11-10, 11-12		f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	repord	E _T - Exhibits 11-10, 11-11, 11-	-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow	-	f _p - Page 11-18		TRD - Page 11-1
LOS - Level of service	BFFS - Base fr	ee-now speed	LOS, S, FFS, v _p - Exhibits 11-	2, 11-3	
DDHV - Directional design h	our volume				

HCS 2010TM Version 6.90

Generated: 5/22/2019 3:55 PM

	RA	MPS AND	RAMP JUNG	CTIONS W	ORKSH	EET				
General Infor	mation			Site Infor	mation					
Analyst			Fre	eeway/Dir of Tr	avel	I-95 NE				
Agency or Company	AEC	ОМ	Jui	nction		Seg 11	-On Ramp 10	th St EB & W	/B	
Date Performed				risdiction						
Analysis Time Period		. 011.15	An	alysis Year		2020 B	uild 1			
Project Description	SW 10th Stree	et SIMR								
Inputs		Fra access Nicoral	an aft anna N	•						
Upstream Adj Ramp		Ramp Number	per of Lanes, N	3 1					Downstre Ramp	am Adj
✓ Yes ☐ On	1	Acceleration L		1200					Yes	On
□ No ☑ Off	f	Deceleration L							✓ No	Off
_ 2000	Freeway Volume, V _F 3900 Ramp Volume, V _D 1160								_	ft
rand random, rR									L _{down} –	10
V = 1310 veh/h 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				70.0					V _D =	veh/h
Conversion to	o nc/h Hn	1	110	50.0						
(pc/h)	V	PHF	Terrain	%Truck	%Rv		f _{HV}	f _p	v = V/PHF	x f _{1.157} x f ₋
Freeway	(Veh/hr) 3900	0.95	Level	3	0		985	1.00		167
Ramp	1160	0.93	Level	2	0	_	990	1.00	 	273
UpStream	1310	0.92	Level	2	0	_	990	1.00	†	438
DownStream										
Fatimatian at		Merge Areas			Fatimas.			erge Areas		
Estimation of					Estimat	ion o	t V ₁₂			
	$V_{12} = V_F$						$V_{12} = V_{F}$	+ (V _F - V _R)P _{FD}	
L _{EQ} =			13-6 or 13-7)		L _{EQ} =		(E	quation 13-	12 or 13-1	3)
P _{FM} =			on (Exhibit 13-6)		P _{FD} =		us	ing Equatio	n (Exhibit 1	3-7)
V ₁₂ =	2546 1621	•	on 13-14 or 13-		V ₁₂ =		рс	/h		
V ₃ or V _{av34}	17)	pc/ii (Equalic	011 13-14 01 13-		V_3 or V_{av34}			/h (Equation 1	3-14 or 13-1	7)
Is V ₃ or V _{av34} > 2,70	0 pc/h?	s 🗹 No						Yes No		
Is V ₃ or V _{av34} > 1.5 *					Is V ₃ or V _{av}	_{/34} > 1.5		Yes No		
If Yes,V _{12a} =			on 13-16, 13-		If Yes,V _{12a} =	=	рс 13-	/h (Equatio 19)	n 13-16, 1	3-18, or
Capacity Che		13-19)			Capacit	v Che	ecks	•		
	Actual	C	apacity	LOS F?			Actual	Car	pacity	LOS F?
					V _F			Exhibit 13-8	8	
V_{FO}	5440	Exhibit 13-8		No	$V_{FO} = V_{F}$	- V _R		Exhibit 13-8	8	
10					V _R			Exhibit 13	-	
Flow Entering	n Merge In	fluence A	rea	<u> </u>		nterin	a Divera	e Influen	ce Area	
. 1011 Lineinig	Actual		Desirable	Violation?			Actual	Max Desi		Violation?
V _{R12}	3819	Exhibit 13-8	4600:All	No	V ₁₂			Exhibit 13-8		
Level of Serv					Level o			rminatio		F)
D _R = 5.475 +	0.00734 v _R + 0	0.0078 V ₁₂ - 0.0	0627 L _A			$D_R = 4$.252 + 0.0	086 V ₁₂ - 0.	.009 L _D	
$D_{R} = 27.2 \text{ (pc/m)}$	i/ln)				$D_R = (p$	oc/mi/lr	۱)			
LOS = C (Exhibit	13-2)				LOS = (E	Exhibit	13-2)			
Speed Detern	nination				Speed L	Deter	mination			
M _S = 0.379 (Exil	bit 13-11)				$D_s = (E_s)^T$	Exhibit 1	3-12)			
l -	(Exhibit 13-11)				S _R = m	ph (Exh	ibit 13-12)			
	(Exhibit 13-11)				$S_0 = m$	ph (Exh	ibit 13-12)			
	(Exhibit 13-13)				S = m	ph (Exh	ibit 13-13)			
						TM				

Generated: 5/22/2019 3:58 PM

	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed	AECOM		Highway/Direction of Travel From/To Jurisdiction	I-95 NB Seg 12-	Bet On Ramps
Analysis Time Period	PM		Analysis Year	2020 Bu	uild 1
Project Description SW 10t	th Street SIMR				
✓ Oper.(LOS))		Des.(N)	□Pla	anning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K	5060	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R	0.95 3 0	
Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	General Terrain: Grade % Length Up/Down %	Level mi	
Calculate Flow Adjustr	ments				
f _p	1.00		E _R	1.2	
É _T	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
Speed Inputs			Calc Speed Adj and FFS	3	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	3		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			
LOS and Performance	Measures		Design (N)		
Operational (LOS) v _p = (V or DDHV) / (PHF x N S D = v _p / S	x f _{HV} x f _p) 1802 65.8 27.4	pc/h/ln mph pc/mi/ln	Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$	$f_{HV} \times f_p)$	pc/h/ln mph pc/mi/ln
LOS	D		Required Number of Lanes, N		P 3
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base freedour volume	-	E_R - Exhibits 11-10, 11-12 E_T - Exhibits 11-10, 11-11, 11- f_p - Page 11-18 LOS, S, FFS, v_p - Exhibits 11-2		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

HCS 2010TM Version 6.90

Generated: 5/22/2019 4:01 PM

			FREEWAY	WEAV	NG WOR	RKSHEE	T			
Genera	l Informati	on			Site Information					
Analyst Agency/Cor Date Perfor Analysis Tir	med	AECO PM	M		Freeway/Dir of Travel I-95 NB Weaving Segment Location Seg 13-Bet On & Off to I Analysis Year 2020 Build 1				Off to Exp	
Project Des	cription SW 10t	h Street SIMI	₹		l					
Inputs										
Weaving se Freeway fre	mber of lanes, figment length, Lie-flow speed, F	s FS		4600ft 70 mph	Segment type Freeway min Freeway max Terrain type	imum speed			Freeway 15 2400 Leve	
Conver	sions to po	1		1			Ι,	Т,	(")	
	V (veh/h)	PHF	Truck (%)	RV (%)	E _T	E _R	f _{HV}	fp	v (pc/h)	
V _{FF}	4095	0.95	3	0	1.5	1.2	0.985	1.00	4375	
V_{RF}	1145	0.92	2	0	1.5	1.2	0.990	1.00	1257	
V_{FR}	965	0.92	2	0	1.5	1.2	0.990	1.00	1059	
V_{RR}	125	0.92	2	0	1.5	1.2	0.990	1.00	137	
V_{NW}	6691							V =	6828	
V_W	137									
VR	0.020									
Configu	ration Cha	aracteris	tics		1					
Minimum m	aneuver lanes,	N_WL		0 lc	Minimum weaving lane changes, LC _{MIN} 411					
·	e density, ID			0.7 int/mi	Weaving lan	e changes, L	$-C_W$		1037 lc/h	
Minimum R	F lane changes	LC _{RF}		0 lc/pc	Non-weaving	g lane chang	es, LC _{NW}		3181 lc/h	
Minimum F	R lane changes	LC_FR		0 lc/pc	Total lane ch	nanges, LC _{AL}	L		4218 lc/h	
Minimum R	R lane changes	, LC _{RR}		3 lc/pc	Non-weaving	g vehicle inde	ex, I _{NW}		2155	
Weavin	g Segmen	t Speed,	Density, I	_evel of	Service,	and Cap	oacity			
Weaving se	egment flow rate	, V		6740 veh/h	Weaving inte	•			0.211	
Weaving se	egment capacity	, c _w		9064 veh/h	Weaving seg				58.9 mph	
•	egment v/c ratio			0.744	Average wea		**		60.4 mph	
•	egment density,	D	29	9.0 pc/mi/ln					58.8 mph	
I evel of Se	, and the second							5913 ft		

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

HCS 2010TM Version 6.90 Generated: 5/22/2019 4:11 PM

General Information			Site Information		
Analyst Agency or Company Date Performed	AECOM		Highway/Direction of Travel From/To Jurisdiction	I-95 NB Seg 14-	North of Hillsboro
Analysis Time Period	AM		Analysis Year	2020 Bu	ıild 1
Project Description SW 10th	Street SIMR				
Oper.(LOS)			Des.(N)	☐ Pla	anning Data
Flow Inputs					
Volume, V AADT	5240	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T	0.95 4	
Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	%RVs, P _R General Terrain: Grade % Length Up/Down %	0 Level mi	
Calculate Flow Adjustm	nents				
f_p	1.00		E _R	1.2	
É _T	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.980	
Speed Inputs			Calc Speed Adj and FFS	3	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_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 I	Measures		Design (N)		
Operational (LOS)			Design (N)		
v _n = (V or DDHV) / (PHF x N x	(f, x f) 1407	pc/h/ln	Design LOS		
S	69.5	mph	$v_p = (V \text{ or DDHV}) / (PHF x N x)$	$f_{HV} \times f_p$)	pc/h/ln
D = v _p / S	20.2	pc/mi/ln	S		mph
LOS	C	P • · · · · · · · · · · · · · · · · · ·	$D = v_p / S$		pc/mi/ln
			Required Number of Lanes, N		
Glossary			Factor Location		
N - Number of lanes	S - Speed		E _R - Exhibits 11-10, 11-12		f _{I W} - Exhibit 11-8
V - Hourly volume	D - Density		E _T - Exhibits 11-10, 11-11, 11-	13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow	speed	f_{n} - Page 11-18	10	TRD - Page 11-1
LOS - Level of service	BFFS - Base fre	ee-flow speed	LOS, S, FFS, v _p - Exhibits 11-2	2. 11-3	IND - I age II-I
DDHV - Directional design hor	ur volume			_,	

	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	AECOM AM		Highway/Direction of Travel From/To Jurisdiction Analysis Year	I-95 SB Seg 1-Be 2020 Bu	et Hillsboro & Palmetto
Project Description SW 10th	h Street SIMR				
✓ Oper.(LOS)			Des.(N)	□Pla	nning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K	4540	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R	0.95 3 0	
Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	General Terrain: Grade % Length Up/Down %	Level mi	
Calculate Flow Adjustr	nents				
f _p E _T	1.00 1.5		E_{R} $f_{HV} = 1/[1+P_{T}(E_{T}-1)+P_{R}(E_{R}-1)]$	1.2 0.985	
Speed Inputs			Calc Speed Adj and FFS	3	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	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	Measures		Design (N)		
Operational (LOS) v _p = (V or DDHV) / (PHF x N s S D = v _p / S LOS	x f _{HV} x f _p) 1213 70.0 17.3 B	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	$f_{HV} \times f_p$)	pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base freeur volume	-	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

HCS 2010TM Version 6.90

Generated: 5/25/2019 9:01 PM

			FREEWAY	WEAV	NG WOR	RKSHEE	T			
Genera	l Informati	on			Site Information					
Analyst Agency/Co Date Perfor Analysis Tir	med	AECO AM	M		Freeway/Dir of Travel 195/SB Weaving Segment Location Seg 2-Bet On from Exp & Off 2020 Build 1					
Project Des	cription SW 10t	h Street SIMI	R		l					
Inputs										
Weaving se Freeway fre	imber of lanes, Name	s FS		5200ft 70 mph	Segment type Freeway min Freeway max Terrain type	imum speed			Freeway 15 2400 Leve	
Conver	sions to po	1		1			Ι,	Т,		
	V (veh/h)	PHF	Truck (%)	RV (%)	E _T	E _R	f _{HV}	fp	v (pc/h)	
V _{FF}	3440	0.95	3	0	1.5	1.2	0.985	1.00	3675	
V_{RF}	1070	0.92	2	0	1.5	1.2	0.990	1.00	1175	
V_{FR}	1100	0.92	2	0	1.5	1.2	0.990	1.00	1208	
V_{RR}	120	0.92	2	0	1.5	1.2	0.990	1.00	132	
V_{NW}	6058							V =	6190	
V_W	132									
VR	0.021									
Configu	ration Cha	aracteris	tics		1					
Minimum m	naneuver lanes,	N_{WL}		0 lc						
•	e density, ID			0.7 int/mi	Weaving lan	e changes, L	$_{C_{W}}$		1064 lc/h	
	F lane changes	14		0 lc/pc	Non-weaving	g lane chang	es, LC _{NW}		3040 lc/h	
Minimum F	R lane changes	LC_FR		0 lc/pc	Total lane ch	nanges, LC _{AL}	L		4104 lc/h	
Minimum R	R lane changes	, LC _{RR}		3 lc/pc	Non-weaving	g vehicle inde	ex, I _{NW}		2205	
Weavin	g Segmen	t Speed,	Density, I	_evel of	Service,	and Cap	oacity			
Weaving se	egment flow rate	, V		6111 veh/h	Weaving inte	•			0.188	
Weaving se	egment capacity	, c _w		9241 veh/h	Weaving seg				59.8 mph	
•	egment v/c ratio	_		0.661	Average wea	• .	**		61.3 mph	
Weaving se	egment density,	ט	25	5.9 pc/mi/ln	Average non		1444		59.7 mph	
Level of Se				С	Maximum we	aavina lanatk	n I		5925 ft	

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

HCS 2010TM Version 6.90 Generated: 5/25/2019 9:10 PM

	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed	AECOM		Highway/Direction of Travel From/To Jurisdiction	I-95 SB Seg 3-B	et Off & On Ramp
Analysis Time Period	AM		Analysis Year	2020 Bu	ild 1
Project Description SW 10					
✓ Oper.(LOS)		Des.(N)	∐ Pla	nning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K	4510	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R	0.95 3 0	
Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	General Terrain: Grade % Length Up/Down %	Level mi	
Calculate Flow Adjust	ments				
f _p	1.00		E _R	1.2	
E _T	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
Speed Inputs			Calc Speed Adj and FFS	6	
Lane Width		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) v _p = (V or DDHV) / (PHF x N	x fx f) 1606	pc/h/ln	<u>Design (N)</u> Design LOS		
S	68.1	mph	$v_p = (V \text{ or DDHV}) / (PHF x N x)$	$f_{HV} \times f_p$)	pc/h/ln
D = v _p / S	23.6	pc/mi/ln	S		mph
LOS	C	ls =	D = v _p / S Required Number of Lanes, N		pc/mi/ln
Glossary			Factor Location		
			i actor Location		
N - Number of lanes	S - Speed		E _R - Exhibits 11-10, 11-12		f _{LW} - Exhibit 11-8
V - Hourly volume	D - Density	, and d	E _T - Exhibits 11-10, 11-11, 11-	-13	f _{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow	-	f _p - Page 11-18		TRD - Page 11-1
LOS - Level of service	BFFS - Base from	ee-flow speed	LOS, S, FFS, v _p - Exhibits 11-	2, 11-3	-
DDHV - Directional design h	our volume				

HCS 2010TM Version 6.90

Generated: 5/25/2019 9:13 PM

	4:	RAMPS	S AND RAM			RKS	HEET			
General Infor	<u>mation</u>			Site Infor						
Analyst				eeway/Dir of Tr		I-95 SE		NA 400 00		
Agency or Company Date Performed	/ AEC	OM		nction risdiction	,	Seg 4-I	Diverge to S	SW 10th St		
Analysis Time Period	d AM			nalysis Year		2020 B	uild 1			
Project Description		et SIMR		,						
Inputs										
Upstream Adj R	Ramn	Freeway Numb	er of Lanes, N	3					Downstre	am Adi
Opolicani Aaj N	tump	Ramp Number	of Lanes, N	1					Ramp	amiraj
□Yes	On	Acceleration La	ane Length, L						✓ Yes	☑ On
	¬o"	Deceleration La	,,	200	200					
✓ No	Off	Freeway Volum	- 5	4510					☐ No	Off
L _{up} = f	ft	Ramp Volume,	•	1180					L _{down} =	1200 ft
ир			11	70.0						
V _u = v	/eh/h	•	Flow Speed, S _{FF}						$V_D =$	1370 veh/ł
· · · · · ·		Ramp Free-Flo	111	45.0						
Conversion t		der Base C	conditions	1	1	-				
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv		f_{HV}	f_p	v = V/PHF	$= x f_{HV} x f_{p}$
Freeway	4510	0.95	Level	3	0	0.	985	1.00	4	819
Ramp	1180	0.92	Level	2	0	+	990	1.00		295
UpStream										
DownStream	1370	0.92	Level	2	0	0.	990	1.00	1	504
		Merge Areas						iverge Areas		
Estimation of	f v ₁₂				Estimati	on o	f v ₁₂			
	V ₁₂ = V _F	(P _{EM})					V ₁₂ =	V _R + (V _F - V _F	P _{ED}	
- _{EQ} =		ation 13-6 or 1	13-7)		L _{EQ} =			Equation 13-1		3)
P _{FM} =		Equation (E	•		P _{FD} =		•	80 using Equ		•
₁₂ =	pc/h	Equation (E	Killbit 10 0)		V ₁₂ =			39 pc/h	adion (Exi	iibit 10-7)
	•	(Equation 12	14 or 12 17)					•	-4: 40 4	4 40 47)
/ ₃ or V _{av34}	•	(Equation 13-	14 01 13-17)		V ₃ or V _{av34}	> 0 7		80 pc/h (Equ	ation 13-1	4 or 13-17)
Is V_3 or $V_{av34} > 2,70$								Yes ✓ No		
Is V_3 or $V_{av34} > 1.5$			16 12 10 or		is v ₃ or v _{av3}	₃₄ > 1.5		Yes ✓ No	10 10 10	10 10
f Yes,V _{12a} =	13-19	(Equation 13-)	16, 13-16, 01		If Yes,V _{12a} =		19	c/h (Equation)	13-16, 13	5-18, 01 13-
Capacity Che		<u>/</u>			Capacity	y Ch	ecks	,		
	Actual	1		1 100 50	 		Actual	1 -	!	1
	Actual	Ca	pacity	LOS F?			Actual	Ca	pacity	LOS F?
	Actual	T Ca	ірасіту	LOS F?	V _F		4819	Exhibit 13-8		LOS F?
V _{EO}	Actual		ірасіту	LOS F?	V_F	- V _D	4819	Exhibit 13-8	7200	No
V _{FO}	Actual	Exhibit 13-8	ipacity	LOS F?	$V_{FO} = V_{F}$	- V _R	4819 3524	Exhibit 13-8 Exhibit 13-8	7200 7200	No No
		Exhibit 13-8		LOSF?	$V_{FO} = V_{F}$ V_{R}		4819 3524 1295	Exhibit 13-8 Exhibit 13-8 Exhibit 13-1	7200 7200 7200 7200	No No No
	g Merge Ir	Exhibit 13-8	rea		$V_{FO} = V_{F}$ V_{R}	terin	4819 3524 1295 g Diver	Exhibit 13-8 Exhibit 13-1 ge Influen	7200 7200 7200 72100 72100 72100	No No No
Flow Entering		Exhibit 13-8 offluence Ai Max D		Violation?	$V_{FO} = V_{F}$ V_{R} Flow En	terin	4819 3524 1295 g Diver Actual	Exhibit 13-8 Exhibit 13-1 Exhibit 13-1 Ge Influen Max Desirat	7200 7200 0 2100 ce Area	No No No Violation?
Flow Entering	g Merge Ir	Exhibit 13-8 Influence Ai Max D Exhibit 13-8	rea Desirable		$V_{FO} = V_F$ V_R Flow En	terin	4819 3524 1295 g Diver Actual	Exhibit 13-8 Exhibit 13-1 Exhibit 13-1 Ge Influen Max Desirat Exhibit 13-8	7200 7200 7200 7200 721000 7200 72	No No No Violation?
Flow Entering V _{R12} Level of Serv	g Merge Ir Actual vice Deterr	Exhibit 13-8 Influence Ai Max D Exhibit 13-8 Influence influen	rea Desirable		$V_{FO} = V_F$ V_R Flow En V_{12} Level of	terin	4819 3524 1295 g Diver Actual 3339 vice Det	Exhibit 13-8 Exhibit 13-1 Ge Influen Max Desirat Exhibit 13-8 Eermination	7200 7200 7200 721	No No No Violation?
Flow Entering V_{R12} Level of Serv $D_{R} = 5.475 + 0.0$	g Merge In Actual vice Detern .00734 v _R +	Exhibit 13-8 Influence Ai Max D Exhibit 13-8 Influence influen	rea Desirable		$V_{FO} = V_F$ V_R Flow En V_{12} Level of	terin	4819 3524 1295 In a Diver Actual 3339 Vice Det 3.252 + 0.	Exhibit 13-8 Exhibit 13-1 Exhibit 13-1 Ge Influen Max Desirat Exhibit 13-8	7200 7200 7200 721	No No No Violation?
Flow Entering V_{R12} Level of Serv $D_{R} = 5.475 + 0.0$ $D_{R} = (pc/mi/ln)$	g Merge In Actual vice Detern .00734 v _R +	Exhibit 13-8 Influence Ai Max D Exhibit 13-8 Influence influen	rea Desirable		$V_{FO} = V_F$ V_R Flow En V_{12} Level of $D_R = 31$	terin	4819 3524 1295 g Diver Actual 3339 vice Det	Exhibit 13-8 Exhibit 13-1 Ge Influen Max Desirat Exhibit 13-8 Eermination	7200 7200 7200 721	No No No Violation?
Flow Entering V_{R12} Level of Serv $D_{R} = 5.475 + 0.0$ $D_{R} = (pc/mi/ln \cdot 0.0)$ $D_{R} = (Exhibit)$	Merge Ir Actual Vice Deterr .00734 v _R +	Exhibit 13-8 Influence Ai Max D Exhibit 13-8 Influence influen	rea Desirable		$V_{FO} = V_{F}$ V_{R} Flow En V_{12} Level of $D_{R} = 31$	terin (Since the content of the c	4819 3524 1295 In a Diver Actual 3339 Vice Det 3.252 + 0.	Exhibit 13-8 Exhibit 13-1 Ge Influen Max Desirat Exhibit 13-8 Eermination	7200 7200 7200 721	No No No Violation?
Flow Entering V_{R12} Level of Serv $D_{R} = 5.475 + 0.0$ $D_{R} = (pc/mi/ln \cdot 0.0) = (Exhibit)$	Merge Ir Actual Vice Deterr .00734 v _R +	Exhibit 13-8 Influence Ai Max D Exhibit 13-8 Influence influen	rea Desirable		$V_{FO} = V_{F}$ V_{R} Flow En V_{12} Level of $D_{R} = 31$	Service (Exhibited the service of th	4819 3524 1295 g Diver Actual 3339 ice Det 4.252 + 0. /mi/ln) bit 13-2)	Exhibit 13-8 Exhibit 13-1 Exhibit 13-1 Exhibit 13-1 Exhibit 13-1 Exhibit 13-8 Exhibit 13-8 Exhibit 13-8 Exhibit 13-8 Exhibit 13-8 Exhibit 13-8	7200 7200 7200 721	No No No Violation?
Flow Entering V_{R12} Level of Serv $D_{R} = 5.475 + 0.0$ $D_{R} = (pc/mi/ln \cdot 0.0) = (Exhibit)$ Speed Determ	Merge In Actual Vice Detern .00734 v R +	Exhibit 13-8 Influence Ai Max D Exhibit 13-8 Influence influen	rea Desirable		$V_{FO} = V_F$ V_R Flow En V_{12} Level of $D_R = 31$ LOS = D Speed D	terin Serv O _R = 4 .2 (pc. (Exhib	4819 3524 1295 g Diver Actual 3339 ice Det 4.252 + 0. /mi/ln) bit 13-2)	Exhibit 13-8 Exhibit 13-1 ge Influen Max Desirat Exhibit 13-8 Exhibit	7200 7200 7200 721	No No No Violation?
Flow Entering V_{R12} Level of Serv $D_R = 5.475 + 0.00$ $D_R = (pc/mi/ln + 0.00)$ $D_R = (Exhibit)$ Speed Determ $M_S = (Exibit)$	g Merge In Actual vice Detern .00734 v _R + n) 13-2) mination 3-11)	Exhibit 13-8 Influence Ai Max D Exhibit 13-8 Influence influen	rea Desirable		$V_{FO} = V_F$ V_R Flow En V_{12} Level of $D_R = 31$ $LOS = D$ Speed D $D_S = 0.6$	terin 3 5 Serv 0 _R = 4 2 (pc, (Exhib) 0eteri	4819 3524 1295 g Diver Actual 3339 /ice Det 1.252 + 0. /mi/ln) bit 13-2) minatio	Exhibit 13-8 Exhibit 13-1 Exhibit 13-1 Exhibit 13-1 Exhibit 13-1 Exhibit 13-8 Exhibit 13-1 Exhibit 13-8 Exhib	7200 7200 7200 721	No No No Violation?
Flow Entering V_{R12} Level of Serv $D_R = 5.475 + 0.0$ $D_R = (pc/mi/ln)$ $D_R = (Exhibit)$ Speed Determ $M_S = (Exibit)$ $D_R = (Exibit)$	Merge In Actual Vice Detern .00734 v R + n) 13-2) mination 3-11) hibit 13-11)	Exhibit 13-8 Influence Ai Max D Exhibit 13-8 Influence influen	rea Desirable		$V_{FO} = V_F$ V_R Flow En V_{12} Level of $D_R = 31$ $LOS = D$ Speed D $D_S = 0.4$ $S_R = 58$	terin Serv C Serv C (Exhibit 15 (E.4 mph	4819 3524 1295 g Diver Actual 3339 /ice Det 1.252 + 0. /mi/ln) bit 13-2) minatio xhibit 13- (Exhibit 1	Exhibit 13-8 Exhibit 13-1 ge Influen Max Desirat Exhibit 13-8 Exhibit 13-12 Exhibit 13-12	7200 7200 7200 721	No No No Violation?
Flow Entering V_{R12} Level of Serv $D_R = 5.475 + 0.00$ $COS = (Exhibit)$ Speed Determ $COS = (Exhibit)$ $COS = (Exh$	g Merge In Actual vice Detern .00734 v _R + n) 13-2) mination 3-11)	Exhibit 13-8 Influence Ai Max D Exhibit 13-8 Influence influen	rea Desirable		$V_{FO} = V_{F}$ V_{R} Flow En V_{12} Level of $D_{R} = 31$ $LOS = D$ Speed D $S_{R} = 58$ $S_{0} = 74$	terin S Serv D _R = 4 .2 (pc. (Exhib) Deteri 415 (E .4 mph .9 mph	4819 3524 1295 g Diver Actual 3339 vice Det 4.252 + 0. /mi/ln) bit 13-2) minatio xhibit 13-	Exhibit 13-8 Exhibit 13-1 Ge Influen Max Desirat Exhibit 13-8 Exhibit 13-12 Exhibit 1	7200 7200 7200 721	No No No Violation?

•	BASIC F	REEWAY SE	GMENTS WORKSHEET			
General Information			Site Information			
Analyst Agency or Company	AECOM		Highway/Direction of Travel From/To	I-95 SB Seg 5-B	et Off & On Ramps	
Date Performed Analysis Time Period	AM		Jurisdiction Analysis Year	2020 Build 1		
Project Description SW 10t	h Street SIMR					
✓ Oper.(LOS))		Des.(N)	□Pla	nning Data	
Flow Inputs						
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D	3300	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		
DDIIV - AADI XIXD		VEII/II	Up/Down %	1111		
Calculate Flow Adjustr	ments					
f_p	1.00		E _R	1.2		
E _T	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985		
Speed Inputs			Calc Speed Adj and FFS	5		
Lane Width		ft				
Rt-Side Lat. Clearance		ft	f_{LW}		mph	
Number of Lanes, N	3		f_{LC}		mph	
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph	
FFS (measured)	70.0	mph	FFS	70.0	mph	
Base free-flow Speed, BFFS		mph				
LOS and Performance	Measures		Design (N)			
Operational (LOS) v _p = (V or DDHV) / (PHF x N	x f _{HV} x f _p) 1175	pc/h/ln	Design (N) Design LOS v _p = (V or DDHV) / (PHF x N x	fxf)	pc/h/ln	
S	70.0	mph	S S	'HV ^ 'p'	mph	
$D = v_p / S$	16.8	pc/mi/ln	D = v _p / S		pc/mi/ln	
LOS	В		Required Number of Lanes, N		F	
Glossary			Factor Location			
N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service	S - Speed D - Density FFS - Free-flow BFFS - Base free	-	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS. S. FFS. v Exhibits 11-		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-1	
DDHV - Directional design ho		ee-now speed	LOS, S, FFS, v _p - Exhibits 11-	2, 11-3		

HCS 2010TM Version 6.90 Generated: 5/25/2019 9:21 PM

	RA	MPS AND	RAMP JUN	CTIONS W	ORKSH	EET				
General Infor				Site Infor						
Analyst			Fr	eeway/Dir of Tr		I-95 S	 BB			
Agency or Company	AEC	OM		inction				n Hillsboro E&V	٧	
Date Performed			Ju	risdiction		J	Ū			
Analysis Time Perio			Ar	nalysis Year		2020	Build 1			
Project Description	SW 10th Stree	et SIMR								
Inputs									1	
Upstream Adj Ramp		Freeway Num	ber of Lanes, N	3					Downstre	am Adj
		Ramp Numbe	r of Lanes, N	1					Ramp	•
✓ Yes ☐ Or	1	Acceleration L	ane Length, L _A	1100					□Yes	☐ On
☐ No ☑ Of	e t	Deceleration I	ane Length L _D							
	No ✓ Off			3300					✓ No	Off
_{up} = 1200 ft Ramp Volume, V _R			•	1370					L _{down} =	ft
• • • • • • • • • • • • • • • • • • •			11	70.0						
/u = 1180 veh/h Freeway Free-Flow Speed, S									$V_D =$	veh/h
Ramp Free-Flow Speed, S _{FR} Conversion to pc/h Under Base Condition			111	50.0						
Conversion t	o pc/h Un	der Base	Conditions							
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv		f_HV	f _p	v = V/PHF	x f _{HV} x f _p
Freeway	3300	0.95	Level	3	0		0.985	1.00	+	3526
Ramp	1370	0.93	Level	2	0		0.990	1.00		1504
UpStream	1180	0.92	Level	2	0	$\overline{}$	0.990	1.00	+	1295
DownStream	1100	0.92	Level		U	+	J.990	1.00		1233
Merge Areas								Diverge Areas		
Estimation o		J			Estimati	ion (of V ₁₂	J		
		/ D \					12			
_	$V_{12} = V_{F}$		10.0 10.7)				$V_{12} = 0$	V _R + (V _F - V _I	$_{R})P_{FD}$	
-EQ =			13-6 or 13-7)		L _{EQ} =		((Equation 13	-12 or 13-1	3)
P _{FM} =			ion (Exhibit 13-6)		P _{FD} =		į	using Equati	on (Exhibit 1	3-7)
V ₁₂ =	2016	•			V ₁₂ =			pc/h		
V_3 or V_{av34}		pc/h (Equati	on 13-14 or 13-		V ₃ or V _{av34}			pc/h (Equation	13-14 or 13-1	7)
Is V_3 or $V_{av34} > 2,70$	17)	a Z Na				,, > 2,		∐Yes □ No		,
								Yes □ No		
Is V_3 or $V_{av34} > 1.5$			10 10 10				112'	pc/h (Equatio	, on 13-16, 1	3-18. or
f Yes,V _{12a} =		pc/h (Equati 13-19)	on 13-16, 13-		If Yes,V _{12a} =			3-19)	J. 10 10, 1	0 10, 01
Capacity Che		10-19)			Capacity	v Cr	necks			
supuoity one	Actual		apacity	LOS F?		, 0.	Actual	Ca	apacity	LOS F?
	7 totaai		apacity	LOOT:	V _F		7101001	Exhibit 13		2001:
						\/				_
V_{FO}	5030	Exhibit 13-8		No	$V_{FO} = V_{F}$	- v _R		Exhibit 13		
					V_R			Exhibit 13	3-	
Flow Entering	a Merae Ir	ofluence A	roa		Flow En	tori	na Dive	rge Influe	nco Aroa	
OW LINEIN	Actual	- ir	Desirable	Violation?	, 10W LII	T	Actual	Max Des		Violation?
V _{R12}	3520	Exhibit 13-8	4600:All	No	V ₁₂		/ totalai	Exhibit 13-8	I	violation:
Level of Serv				110		F S0*	rvice Do	termination	n (if not	<i>F</i>)
					1				•	' /
	0.00734 v _R +	0.0076 v ₁₂ - 0.1	JUUZI LA					.0086 V ₁₂ - 0	7.009 L _D	
$O_{R} = 25.3 (\text{pc/n})$,					c/mi/	•			
LOS = C (Exhibit					LOS = (E	xhibi	it 13-2)			
Speed Deteri	mination				Speed D	ete	rminatio	on		
M _S = 0.343 (Ex	ibit 13-11)				$D_s = (E$	xhibit	13-12)			
-	(Exhibit 13-11)						, (hibit 13-12)			
	(Exhibit 13-11)						(hibit 13-12)			
•	(Exhibit 13-11)					. ,	khibit 13-13)			
•	· · · · · · · · · · · · · · · · · · ·	thto Bosoniad			Γ '''	γι. (∟ χ				rod: E/2E/2010

Generated: 5/25/2019 9:25 PM

	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	AECOM AM		Highway/Direction of Travel From/To Jurisdiction Analysis Year	I-95 SB Seg 7-Be 2020 Bu	et On Ramps ild 1
Project Description SW 10t					
✓ Oper.(LOS))		Des.(N)	∐Pla	nning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K	4700	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R	0.95 3 0	
Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	General Terrain: Grade % Length Up/Down %	Level mi	
Calculate Flow Adjustr	ments				
f _p E _T	1.00 1.5		E_{R} $f_{HV} = 1/[1+P_{T}(E_{T}-1)+P_{R}(E_{R}-1)]$	1.2 0.985	
Speed Inputs			Calc Speed Adj and FFS	3	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	3		f _{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			
LOS and Performance	Measures		Design (N)		
Operational (LOS) $v_p = (V \text{ or DDHV}) / (PHF \times N)$ S $D = v_p / S$ LOS	x f _{HV} x f _p) 1674 67.4 24.8 C	pc/h/ln mph pc/mi/ln	Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$ Required Number of Lanes, N	$f_{HV} \times f_p$)	pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base freedour volume	-	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

HCS 2010TM Version 6.90

Generated: 5/25/2019 9:28 PM

Job: SW 10th Street SIMR

Analyst: AECOM

Location: Seg 8: I-95 Southbound On-Ramp from SW 10th Street EB & WB

Analysis Period: AM Peak Hour

Analysis Year: 2020 Build 1



Downstream Freeway Tr % = 3%

Freeway f_{HV} = 1/(1+P_T(E_T-1)+P_R(E_R-1)) = 0.985 Ramp f_{HV} = 1/(1+P_T(E_T-1)+P_R(E_R-1)) = 0.9901

flat terrain $E_T = 1.5$ RV % = 0

Driver Population adj. $f_P = 1.000$

 $V_{fr} = = V_{fr}/(PHF)(f_{HV})(f_{P}) = V_{r} = = V_{r}/(PHF)(f_{HV})(f_{P}) = V_{f} = = V_{f}/(PHF)(f_{HV})(f_{P}) f_{P}) = V_{f}/(PHF)(f_{HV})(f_{P})($

6,325 pc/h 1,297 pc/h 5,022 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	6,325	0.66	No	
3	Fwy upstream of ramp (assume 70 mph free-flow speed) =	7,200	5,022	0.70	No	
1	Capacity on On-Ramp (assume 45 mph free-flow speed) =	2,100	1,297	0.62	No	

	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	AECOM AM		Highway/Direction of Travel From/To Jurisdiction Analysis Year	I-95 SB Seg 9-Be 2020 Bu	et 10th & Exit to Exp ild 1
Project Description SW 10th	h Street SIMR		2 (41)		
✓ Oper.(LOS) Flow Inputs			Des.(N)	⊔Pia	nning Data
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D	5920	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain:	0.95 3 0 Level	
DDHV = AADTX K X D		veh/h	Grade % Length Up/Down %	mi	
Calculate Flow Adjustr	nents				
f _p E _T	1.00 1.5		E_R $f_{HV} = 1/[1+P_T(E_T-1)+P_R(E_R-1)]$	1.2 0.985	
Speed Inputs			Calc Speed Adj and FFS	3	
Lane Width		ft	,		
Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured) Base free-flow Speed, BFFS	<i>4</i> 70.0	ft ramps/mi mph mph	f _{LW} f _{LC} TRD Adjustment FFS	70.0	mph mph mph mph
LOS and Performance	Measures		Design (N)		
Operational (LOS) $v_p = (V \text{ or DDHV}) / (PHF \times N)$ S $D = v_p / S$ LOS		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	$f_{HV} \times f_p$)	pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base fre ur volume	-	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-2		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

HCS 2010TM Version 6.90

Generated: 5/25/2019 9:38 PM

<u> </u>	.	RAMPS	AND RAM			RKS	HEET			
General In	tormation			Site Infor						
Analyst	. – .			eeway/Dir of Tr		I-95 SE		_		
Agency or Comp Date Performed	any AEC	OM		nction risdiction	,	Seg 10	- Diverge to	Express		
Analysis Time P	eriod AM			alysis Year		2020 B	uild 1			
	on SW 10th Stre	et SIMR	7.1.	aryono i oar		2020 0	uliu i			
nputs										
Upstream A	.di Ramn	Freeway Numb	er of Lanes, N	4					Downstrea	am Adi
Opsticalii A	ay ramp	Ramp Number	of Lanes, N	1					Ramp	ani Auj
Yes	✓ On	Acceleration La							□ Yes	On
□ Na	□ 0 #	Deceleration La	,,	300						
□No	Off	Freeway Volun	- 0	5920					✓ No	Off
L _{up} =	4500 ft	Ramp Volume,	•	860				Į	down =	ft
ир			*R Flow Speed, S _{FF}	70.0						
$V_u =$	1220 veh/h	Ramp Free-Flo							√ _D =	veh/h
2	4			45.0						
onversio	n to pc/h Un	der Base C	onaitions		1	_		1		
(pc/h)	(Veh/hr)	PHF	Terrain	%Truck	%Rv		f_{HV}	f _p	/ = V/PHF	$x f_{HV} x f_{p}$
Freeway	5920	0.95	Level	3	0	0.	985	1.00	63	325
Ramp	860	0.92	Level	2	0		990	1.00		44
UpStream	1220	0.92	Level	2	0	0.	990	1.00	13	339
DownStream										
		Merge Areas						verge Areas		
Estimation	of v ₁₂				Estimati	on o	f v ₁₂			
	V ₁₂ = V ₁	(P _{EM})					V ₁₂ =	V _R + (V _F - V _R)P _{ED}	
- _{EQ} =		ation 13-6 or	13-7)		L _{EQ} =			quation 13-12		5)
P _{FM} =	• •	g Equation (E	•		P _{FD} =		•	36 using Equ		•
/ ₁₂ =	pc/h	<i>y</i>	() () () () () () () () () ()		V ₁₂ =			00 doing <u>-</u> qu 90 pc/h	ation (Exi	10 17
/ ₁₂ / ₃ or V _{av34}	•	(Equation 13-	14 or 13 17)		V ₁₂ V ₃ or V _{av34}			•	tion 12 1	1 or 12 17)
			14 01 13-17)			> 2 7		17 pc/h (Equa	111011 13-14	+ 01 13-17)
	2,700 pc/h? ☐ Y€							Yes ☑ No		
0 0.0.	1.5 * V ₁₂ /2 \(\text{Y}\) \(\text{Y}\)	es ∐ No (Equation 13-	16 12 19 or					Yes ✓ No	10 16 10	10 or 12
Yes,V _{12a} =	13-19		10, 13-10, 01		If Yes,V _{12a} =		ρι 19	c/h (Equation)	13-10, 13	-10, 01 13-
Capacity C		,			Capacity	y Ch	ecks	,		
	Actual	Ca	pacity	LOS F?			Actual	Cap	acity	LOS F?
					V _F		6325	Exhibit 13-8	9600	No
V_{FO}		Exhibit 13-8			$V_{FO} = V_{F}$	- V _R	5381	Exhibit 13-8	9600	No
10					V _R	- 1	944	Exhibit 13-10	2100	No
Jow Entor	ring Merge II	nfluonco A	ro2	<u> </u>		torin		ge Influenc	<u> </u>	110
TOW LINE	Actual		esirable	Violation?	I IOW LII	- I	Actual	Max Desirabl		Violation?
V _{R12}	7.0001	Exhibit 13-8			V ₁₂	_	3290	Exhibit 13-8	4400:All	No
	ervice Deter		f not E)		t			ermination		
	+ 0.00734 v _R +							0086 V ₁₂ - 0.0	_	• /
		3.3375 V ₁₂	0.00027 L _A			• •		12 - 0.0	-D	
$O_R = (pc/m)$,						/mi/ln)			
•	bit 13-2)				 	-	oit 13-2)			
Speed Det		Speed D								
√s = (Exib	it 13-11)			$D_{s} = 0.3$	383 (E	xhibit 13-	12)			
	Exhibit 13-11)			S _R = 59	.3 mph	(Exhibit 1	13-12)			
., ' '	•				1 mnh	(Exhibit 1	13_12)			
	Exhibit 13-11)				\circ_0	. 4 mpn	(⊏XIIIDIL I	10-12)		
$S_0 = mph ($	Exhibit 13-11) Exhibit 13-13)				ľ		(Exhibit 1	•		

	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed	AECOM		Highway/Direction of Travel From/To Jurisdiction	I-95 SB Seg 11-l	Bet Off Exp Off Sample
Analysis Time Period	AM		Analysis Year	2020 Bu	ild 1
Project Description SW 10th	h Street SIMR				
✓ Oper.(LOS)			Des.(N)	□Pla	anning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K	5060	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R	0.95 3 0	
Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	General Terrain: Grade % Length Up/Down %	Level mi	
Calculate Flow Adjustr	nents				
f _p	1.00		E _R	1.2	
E _T	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
Speed Inputs			Calc Speed Adj and FFS	3	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	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	Measures		Design (N)		
<u>Operational (LOS)</u> v _p = (V or DDHV) / (PHF x N : S	× f _{HV} × f _p) 1352 69.7	pc/h/ln mph	Design (N) Design LOS v _p = (V or DDHV) / (PHF x N x	$f_{HV} \times f_p$)	pc/h/ln
$D = v_p / S$	19.4	pc/mi/ln	S D = v / S		mph
LOS	С		D = v _p / S Required Number of Lanes, N		pc/mi/ln
Glossary			Factor Location		
N - Number of lanes	S - Speed				
V - Hourly volume	D - Density		E _R - Exhibits 11-10, 11-12		f _{LW} - Exhibit 11-8
v _p - Flow rate	FFS - Free-flow	speed	E _T - Exhibits 11-10, 11-11, 11-	-13	f _{LC} - Exhibit 11-9
LOS - Level of service	BFFS - Base from	-	f _p - Page 11-18		TRD - Page 11-11
DDHV - Directional design ho		- 1	LOS, S, FFS, v _p - Exhibits 11-	2, 11-3	

HCS 2010TM Version 6.90

Generated: 5/25/2019 9:48 PM

Job: SW 10th Street SIMR Analyst: AECOM Location: Seg 12: I-95 SB Off-Ramp to Sample Road EB & WB **Analysis Period: AM Peak Hour Analysis Year:** 2020 Build 1 4,180 5,060 880 0.95 PHF = $V_{fr} =$ **5,060** vph $v_r =$ **880** vph $V_f =$ 4,180 Upstream Freeway Tr % = 3% Ramp Tr % = 2% **Downstream Freeway Tr % =** 3% $1/(1+P_T(E_T-1)+P_R(E_R-1)) =$ 0.985 Freeway f_{HV} = **Ramp f**_{HV} = $1/(1+P_T(E_T-1)+P_R(E_R-1)) =$ 0.9901 flat terrain E_T = 1.5 **RV** % = 0 Driver Population adj. $f_P =$ 1.000 $V_{fr} = = V_{fr}/(PHF)(f_{HV})(f_{P}) =$ 5,406 pc/h $V_r = = = V_r/(PHF)(f_{HV})(f_P) =$ 936 pc/h $V_f =$ $=v_f/(PHF)(f_{HV})(f_P)=$ 4,466 pc/h No. lanes upstream of ramp N =Average Freeway Density Upstream of Diverge (see Equation 13-26): $D = 0.0175 (V_{fr}/N) =$ 23.7 pc/In LOS in the Diverge Area (from Density and Exhibit 13-2) = No. Ln Capacity Check (see Exhibits 13-2, 13-8 and 13.10) Maximum Actual LOS F? Fwy upstream of ramp (assume 70 mph free-flow speed) = 9.600 5.406 No 3 Fwy downstream of ramp (assume 70 mph free-flow speed) = 7,200 4,466 No Capacity on Off-Ramp (assume 45 mph free-flow speed) = 936 No 2,100

	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
Analysis Time Period	AM		Analysis Year	2020 Bu	uild 1
Project Description SW 10t	h Street SIMR				
✓ Oper.(LOS))		Des.(N)	□Pla	anning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K	4180	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R	0.95 3 0	
Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	General Terrain: Grade % Length Up/Down %	Level mi	
Calculate Flow Adjustr	ments				
f _p	1.00		E _R	1.2	
E _T	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
Speed Inputs			Calc Speed Adj and FFS	6	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_LW		mph
Number of Lanes, N	3		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			
LOS and Performance	Measures		Design (N)		
Operational (LOS) v _p = (V or DDHV) / (PHF x N S D = v _p / S	x f _{HV} x f _p) 1489 69.0 21.6	pc/h/ln mph pc/mi/ln	Design (N) Design LOS v _p = (V or DDHV) / (PHF x N x S	$f_{HV} \times f_p$)	pc/h/ln mph
LOS	С		D = v _p / S Required Number of Lanes, N		pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base freedour volume	-	E_R - Exhibits 11-10, 11-12 E_T - Exhibits 11-10, 11-11, 11- f_p - Page 11-18 LOS, S, FFS, v_p - Exhibits 11-2		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

HCS 2010TM Version 6.90

Generated: 5/25/2019 9:58 PM

			REEWAY	/ WEAV	NG WOE	KSHEE	т		
Gener	al Information		INLLANA	VVLAVI	Site Info				
Analyst Agency/C Date Perf	ompany	AECON AM	Л		Freeway/Dir of Travel I-95 SB Weaving Segment Location Seg 14- Bet Sample & Copans Analysis Year 2020 Build 1				
	escription SW 10th	n Street SIMR	}						
Inputs					<u> </u>				
Weaving i Weaving s Freeway f	configuration number of lanes, N segment length, L _s free-flow speed, FF	S FS	r Poor Co	2520ft 70 mph	Terrain type				Freeway 15 2400 Leve
Conve	V (veh/h)	PHF	Truck (%)	RV (%)	E _T	E _R	f _{HV}	fp	v (pc/h)
V _{FF}	3575	0.95	3	0	1.5	1.2	0.985	1.00	3820
V _{RF}	1790	0.92	2	0	1.5	1.2	0.990	1.00	1965
V _{FR}	605	0.92	2	0	1.5	1.2	0.990	1.00	664
V _{RR}	0	0.95	0	0	1.5	1.2	1.000	1.00	0
V _{NW}	3820	-						V =	6449
V _W	2629								
VR VR	0.408								
Config	uration Cha	racterist	tics						
Minimum	maneuver lanes, l	N_{WL}		2 lc	Minimum we	eaving lane c	hanges, LC _{MIN}	l	lc/h
Interchan	ge density, ID			0.7 int/mi	Weaving lan	ne changes, l	_C _w		lc/h
Minimum	RF lane changes,	LC_RF		1 lc/pc	Non-weaving	g lane chang	es, LC _{NW}		lc/h
Minimum	FR lane changes,	LC_FR		1 lc/pc	Total lane ch	nanges, LC _{AL}	L		lc/h
Minimum	RR lane changes,	LC_RR		lc/pc	Non-weaving	g vehicle ind	ex, I _{NW}		792
Weavi	ng Segment	Speed,	Density, l	Level of	Service,	and Ca	oacity		
Weaving	segment flow rate,			6367 veh/h 5800 veh/h	Weaving seg	ensity factor, gment speed aving speed,	, S		mph mph
	segment v/c ratio segment density, [)		1.098 pc/mi/ln	, "				mph
ı	Service, LOS	-		F		eaving length			6767 ft
Notes					•				

Notes

Copyright © 2016 University of Florida, All Rights Reserved

HCS 2010TM Version 6.90

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

	BASIC F	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	AECOM PM		Highway/Direction of Travel From/To Jurisdiction Analysis Year	I-95 SB Seg 1-Be 2020 Bu	et Hillsboro & Palmetto
Project Description SW 10t			7 thanyono i can	2020 Ba	na r
✓ Oper.(LOS)			Des.(N)	□Pla	nning Data
Flow Inputs			,		
Volume, V AADT Peak-Hr Prop. of AADT, K	4990	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R	0.95 3 0	
Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	General Terrain: Grade % Length Up/Down %	Level mi	
Calculate Flow Adjustr	ments				
f _p E _T	1.00 1.5		E_{R} $f_{HV} = 1/[1+P_{T}(E_{T}-1)+P_{R}(E_{R}-1)]$	1.2 0.985	
Speed Inputs			Calc Speed Adj and FFS	3	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	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	Measures		Design (N)		
Operational (LOS) v _p = (V or DDHV) / (PHF x N S D = v _p / S LOS		pc/h/ln mph pc/mi/ln	Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$ Required Number of Lanes, N	·	pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base freedour volume	-	E_R - Exhibits 11-10, 11-12 E_T - Exhibits 11-10, 11-11, 11- f_p - Page 11-18 LOS, S, FFS, v_p - Exhibits 11-		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

HCS 2010TM Version 6.90

Generated: 5/25/2019 9:03 PM

		F	REEWAY	/ WEAV	NG WOF	RKSHEE	T		
Genera	l Informati	on			Site Info	rmation			
Analyst Agency/Co Date Perfo Analysis Ti	rmed	AECON PM	Л		Freeway/Dir Weaving Seg Analysis Yea	gment Locati		B 2-Bet On from Build 1	Exp & Off
Project Des	scription SW 10t	h Street SIMF	}						
Inputs					•				
Weaving no Weaving se Freeway fro	onfiguration umber of lanes, N egment length, L _e ee-flow speed, Fl	S FS		5200ft 70 mph	Segment typ Freeway min Freeway ma: Terrain type	imum speed			Freeway 15 2400 Leve
Conver	rsions to po	1	1	1		l –	1 ,	1 ,	1 (")
	V (veh/h)	PHF	Truck (%)	RV (%)	E _T	E _R	f _{HV}	fp	v (pc/h)
V _{FF}	4055	0.95	3	0	1.5	1.2	0.985	1.00	4332
V_{RF}	1105	0.92	2	0	1.5	1.2	0.990	1.00	1213
V_{FR}	935	0.92	2	0	1.5	1.2	0.990	1.00	1026
V_{RR}	125	0.92	2	0	1.5	1.2	0.990	1.00	137
V_{NW}	6571							V =	6708
V_W	137								
VR	0.020								
Config	uration Cha	aracteris	tics		1				
Minimum r	naneuver lanes,	N_{WL}		0 lc		_	hanges, LC _{MIN}	I	411 lc/h
ľ	e density, ID			0.7 int/mi	Weaving lan	e changes, L	.C _w		1079 lc/h
Minimum F	RF lane changes,	LC_{RF}		0 lc/pc	Non-weaving	g lane chang	es, LC _{NW}		3154 lc/h
Minimum F	R lane changes,	LC_FR		0 lc/pc	Total lane ch	nanges, LC _{AL}	L		4233 lc/h
Minimum F	RR lane changes	, LC _{RR}		3 lc/pc	Non-weaving	g vehicle inde	ex, I _{NW}		2392
Weavir	ig Segmen	t Speed,	Density, l	Level of	Service,	and Cap	oacity		
Weaving s	egment flow rate	, V		6622 veh/h	_	ensity factor,			0.192
Weaving s	egment capacity	, C _W		9241 veh/h	,	gment speed			59.0 mph
	egment v/c ratio			0.717	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			61.1 mph	
_	Veaving segment density, D 28.4 pc/mi/li								
	ervice, LOS			D	Maximum w	eaving length	ı, L _{MAX}		5916 ft
Notes									

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

HCS 2010TM Version 6.90 Generated: 5/25/2019 9:12 PM

	BASIC I	REEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst Agency or Company Date Performed	AECOM		Highway/Direction of Travel From/To Jurisdiction	I-95 SB Seg 3-B	et Off & On Ramp
Analysis Time Period	PM		Analysis Year	2020 Bu	ild 1
Project Description SW 10t					
✓ Oper.(LOS))		Des.(N)	Pla	nning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K	5160	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R	0.95 3 0	
Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	General Terrain: Grade % Length Up/Down %	Level mi	
Calculate Flow 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	S	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	3		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			
LOS and Performance	Measures		Design (N)		
Operational (LOS) v _p = (V or DDHV) / (PHF x N	x f x f) 1838	pc/h/ln	<u>Design (N)</u> Design LOS		
S	65.3	mph	$v_p = (V \text{ or DDHV}) / (PHF x N x)$	$f_{HV} \times f_p$	pc/h/ln
D = v _p / S	28.2	pc/mi/ln	S		mph
LOS	D	P 0,	$D = v_p / S$		pc/mi/ln
			Required Number of Lanes, N		
Glossary			Factor Location		
N - Number of lanes	S - Speed		E _R - Exhibits 11-10, 11-12		f _{I W} - Exhibit 11-8
V - Hourly volume	D - Density		$E_{\rm R}$ - Exhibits 11-10, 11-12 $E_{\rm T}$ - Exhibits 11-10, 11-11, 11-	-13	f_{LC} - Exhibit 11-9
v _p - Flow rate	FFS - Free-flow	speed	f _p - Page 11-18	- 1 U	TRD - Page 11-1
LOS - Level of service	BFFS - Base fr	ee-flow speed	LOS, S, FFS, v _p - Exhibits 11-	2 11-3	IND - Paye 11-1
DDHV - Directional design ho	our volume			<u>-</u> , 11⁻∪	

HCS 2010TM Version 6.90

Generated: 5/25/2019 9:15 PM

		RAMP	S AND RAM	P JUNCTI	ONS WO	RKS	HEET			
General Info	rmation			Site Infor						
Analyst				eeway/Dir of Tr		I-95 SE				
Agency or Compar Date Performed	y AEC	COM		nction risdiction		Seg 4-	Diverge to S	SW 10th St		
Analysis Time Peri	od PM			alysis Year		2020 B	uild 1			
Project Description		et SIMR		u., u.u.		2020 2	ana i			
nputs										
Upstream Adj	Ramn	Freeway Num	ber of Lanes, N	3					Downstre	am Adi
opsiream / taj	ramp	Ramp Number	r of Lanes, N	1					Ramp	ani 7 aj
☐Yes	□On	Acceleration L	ane Length, L _A						✓ Yes	☑ On
Na	□ 0 #		ane Length L _n	200						
✓ No	Off	Freeway Volur	- 5	5160					☐ No	Off
L _{up} =	ft	Ramp Volume		1250					L _{down} =	1200 ft
ир			, * _R -Flow Speed, S _{FF}	70.0						
V _u =	veh/h								$V_D =$	1500 veh/h
2	4 //- 11		ow Speed, S _{FR}	45.0						
Conversion	to pc/n Un		<i>Sonaitions</i>		<u> </u>		ĺ			
(pc/h)	(Veh/hr)	PHF	Terrain	%Truck	%Rv		f_{HV}	f_p	v = V/PHI	$= x f_{HV} x f_{p}$
Freeway	5160	0.95	Level	3	0	0.	985	1.00	5	513
Ramp	1250	0.92	Level	2	0	0.	990	1.00	1	372
UpStream										
DownStream	1500	0.92	Level	2	0	0.	990	1.00	1	647
	_	Merge Areas						iverge Areas		
Estimation o	of v ₁₂				Estimat	ion o	of v ₁₂			
	V ₁₂ = V ₁	(P _{FM})					V ₁₂ =	V _R + (V _F - V _F	P _{FD}	
- _{EQ} =	(Equ	ation 13-6 or	13-7)		L _{EQ} =		 (I	Equation 13-1	2 or 13-1	3)
P _{FM} =		g Equation (E	•		P _{FD} =		•	559 using Equ		•
/ ₁₂ =	pc/h	, , ,	,		V ₁₂ =			687 pc/h	,	,
V_3 or V_{av34}	-	(Equation 13-	-14 or 13-17)		V ₃ or V _{av34}			26 pc/h (Equ	ation 13-1	4 or 13-17)
Is V_3 or $V_{av34} > 2.7$	-	•	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			., > 2.7		Yes ☑ No	u 10 .	,
Is V_3 or $V_{av34} > 1.5$								Yes ☑ No		
			-16, 13-18, or					c/h (Equation	13-16, 13	3-18. or 13-
f Yes,V _{12a} =	13-19				If Yes,V _{12a} =	-	19			,
Capacity Ch	ecks				Capacit	y Ch	ecks			
	Actual	C	apacity	LOS F?			Actual	Ca	pacity	LOS F?
					V _F		5513	Exhibit 13-8	7200	No
V_{FO}		Exhibit 13-8			$V_{FO} = V_{F}$	- V _R	4141	Exhibit 13-8	7200	No
					V_R		1372	Exhibit 13-1	0 2100	No
Flow Enterin	na Merae II	nfluence A	rea				a Dive	rge Influen	ce Area	!
	Actual	1	Desirable	Violation?	1011		Actual	Max Desirab		Violation?
V _{R12}		Exhibit 13-8			V ₁₂	(3687	Exhibit 13-8	4400:All	No
Level of Ser	vice Deter	mination (i	f not F)			Ser	vice De	terminatio	n (if not	F)
D _R = 5.475 + 0								.0086 V ₁₂ - 0.		,
) _R = (pc/mi/	• • •	12	A				/mi/ln)	12	D	
.OS = (Exhibi	•						,			
							bit 13-2)	<u> </u>		
Speed Deter					Speed L					
$M_{\rm S} = (Exibit)$		ľ		xhibit 13-	•					
S _R = mph (E)	thibit 13-11)				-	(Exhibit	•			
$S_0 = mph (E)$	hibit 13-11)				$S_0 = 73$	3.6 mph	(Exhibit	13-12)		
					lo					
S = mph (E)	(hibit 13-13)				S = 62	2.5 mph	(Exhibit	13-13)		

	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-Be 2020 Bu	et Off & On Ramps
Project Description SW 10to	h Street SIMR				
✓ Oper.(LOS)			Des.(N)	□Pla	nning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D	3910	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 E _T	1.00 1.5		E_R $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	1.2 0.985	
Speed Inputs			Calc Speed Adj and FFS	3	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N Total Ramp Density, TRD	3	ramps/mi	f _{LC} TRD Adjustment		mph mph
FFS (measured) Base free-flow Speed, BFFS	70.0	mph mph	FFS FFS	70.0	mph
LOS and Performance	Measures		Design (N)		
Operational (LOS) v _p = (V or DDHV) / (PHF x N : S D = v _p / S LOS		pc/h/ln mph pc/mi/ln	Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$ Required Number of Lanes, N	·	pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base freeur volume	-	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

HCS 2010TM Version 6.90

Generated: 5/25/2019 9:23 PM

	RA	MPS AND	RAMP JUN	CTIONS W	ORKSH	EET				
General Info		•		Site Infor						
Analyst			Fr	eeway/Dir of Tr		I-95 S				
Agency or Company	y AEC	OM		nction Seg 6-Merge from Hills		Hillsboro F&W	I			
Date Performed	,0	•		risdiction		0090				
Analysis Time Perio	od PM		Ar	nalysis Year		2020	Build 1			
Project Description	SW 10th Stree	et SIMR								
Inputs										
Upstream Adj Ramp	1	Freeway Num	ber of Lanes, N	3					Downstre	am ∆di
	,	Ramp Numbe	r of Lanes, N	1					Ramp	arri 7 taj
✓ Yes □ O	n	1	ane Length, L	1100						
			,,	1100					☐Yes	☐ On
□ No ☑ O	ff		Lane Length L _D	2012					✓ No	Off
	-	Freeway Volu	•	3910					-	ft
L _{up} = 1200	π	Ramp Volume	e, V _R	1500					L _{down} =	11
V – 1050	a b /b	Freeway Free	-Flow Speed, S _{FF}	70.0					V _D =	veh/h
$V_{\rm u} = 1250$	veh/h	Ramp Free-Fl	low Speed, S _{FR}	50.0					l'b	VCIIIII
Conversion	to pc/h Un		111						<u> </u>	
	V			0/ T!:	0/ D	Т	f	ŧ	v = \//DLIF	vf vf
(pc/h)	(Veh/hr)	PHF	Terrain	%Truck	%Rv		f _{HV}	f _p	v = V/PHF	х I _{HV} х I _р
Freeway	3910	0.95	Level	3	0	(0.985	1.00	4	178
Ramp	1500	0.92	Level	2	0	(0.990	1.00	1	647
UpStream	1250	0.92	Level	2	0	(0.990	1.00	1	372
DownStream										
		Merge Areas						Diverge Areas		
Estimation o	f v ₁₂				Estimati	ion (of v ₁₂			
	V ₁₂ = V _F	(P _{EM})							\D	
l =			13-6 or 13-7)					V _R + (V _F - V _F		
L _{EQ} = D -		· ·	•		L _{EQ} =		((Equation 13	-12 or 13-1	3)
P _{FM} =			tion (Exhibit 13-6)		P _{FD} =		Ţ	using Equation	on (Exhibit 1	3-7)
V ₁₂ =	2344	•			V ₁₂ =		1	pc/h		
V ₃ or V _{av34}	1834 17)	pc/h (Equati	on 13-14 or 13-		${ m V_3}$ or ${ m V_{av34}}$			pc/h (Equation	13-14 or 13-1	7)
Is V ₃ or V _{av34} > 2,7	,	o II No				, > 2,	700 pc/h? [∃Yes □ No)	
								□Yes □ No		
Is V ₃ or V _{av34} > 1.5			- 40 40 40				12-	pc/h (Equatio	on 13-16. 1	3-18. or
If Yes,V _{12a} =		pc/n (Equati 13-19)	on 13-16, 13-		If Yes,V _{12a} =	-		3-19)	,	,
Capacity Ch		10 10)			Capacit	v Cr	necks			
Cupacity Circ	Actual	1 (Capacity	LOS F?	Capacit	, 0.	Actual	Ca	pacity	LOS F?
	Hotaai		rapaoity	2001.	V _F		7101001	Exhibit 13-		20011
						\/				_
V_{FO}	5825	Exhibit 13-8		No	$V_{FO} = V_{F}$	- v _R		Exhibit 13-		
					V_R			Exhibit 13	3-	
Flow Enterin	a Morgo Ir	ofluoneo /	lroa		Flow En	tori	na Divo	rge Influei	nco Aroa	
I IOW LIICHIII	Actual	- ir	Desirable	Violation?	I IOW EII	T	Actual	Max Des		Violation?
V _{R12}	4034	Exhibit 13-8	4600:All	No	V ₁₂	+	, totaai	Exhibit 13-8	αδίο	v iolation !
				INU		[C -	nica Da) (if == 1	E)
Level of Serv					1			terminatio	•	<u>r)</u>
• • • • • • • • • • • • • • • • • • • •	+ 0.00734 v _R +	u.uu/8 V ₁₂ - 0.	00621 L _A					.0086 V ₁₂ - 0	1.009 L _D	
$D_{R} = 29.3 (pc/r)$	mi/ln)				$D_R = (p$	c/mi/	ln)			
LOS = D (Exhibit	LOS = (Exhibit 13-2)									
Speed Deter	Speed D	ete	rminatio	on						
	ribit 13-11)			Speed Determination D _s = (Exhibit 13-12)						
•	•									
	(Exhibit 13-11)				S _R = mph (Exhibit 13-12)					
•	(Exhibit 13-11)				ľ	. ,	(hibit 13-12)			
S = 60.0 mph	(Exhibit 13-13)				S = m _l	ph (Ex	(hibit 13-13)			
L+ @ 0040 -::+.	of Florida All Dia				_				_	od: E/2E/2010

Generated: 5/25/2019 9:27 PM

	,,,,	GMENTS WORKSHEET		
		Site Information		
AECOM		Highway/Direction of Travel From/To	I-95 SB Seg 7-B	et On Ramps
PM		Analysis Year	2020 Bu	ild 1
Street SIMR				
		Des.(N)	□Pla	nning Data
5410	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T	0.95 3	
	veh/h	General Terrain: Grade % Length Up/Down %	Level mi	
nents				
1.00		E _R	1.2	
1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985	
		Calc Speed Adj and FFS	3	
	ft			
	ft	f_{LW}		mph
3		f_{LC}		mph
	ramps/mi	TRD Adjustment		mph
70.0	mph	FFS	70.0	mph
	mph			
Measures		Design (N)		
(f _{HV} x f _p) 1927 63.9	pc/h/ln mph	L ^r	$f_{HV} \times f_p$)	pc/h/ln
30.2	pc/mi/ln			mph
D		r		pc/mi/ln
		Factor Location		
S - Speed				
•		E _R - Exhibits 11-10, 11-12		f _{LW} - Exhibit 11-8
	speed	·	13	f _{LC} - Exhibit 11-9
	-	1.		TRD - Page 11-11
ur volume	•	LOS, S, FFS, v _p - Exhibits 11-2	2, 11-3	
	PM Street SIMR 5410 5410 1.5 1.00 1.5 3 70.0 Measures 4 f _{HV} x f _p) 1927 63.9 30.2 D S - Speed D - Density FFS - Free-flow BFFS - Base free	### Street SIMR 5410	AECOM PM ABCOM PM Analysis Year Des.(N) Street SIMR Des.(N) Des.(N) Des.(N) Des.(N) Des.(N) Des.(N) Des.(N) Des.(N) Des.(N) Des.(N) Des.(N) Des.(N) Des.(N) Des.(N) Des.(N) Des.(N) Des.(N) Des.(N) Des.(N) Des.(N)	AECOM PM Analysis Year Des.(N) Peak-Hour Factor, PHF Veh/day Veh/h Veh/day Peak-Hour Factor, PHF Veh/ay Peak-Hour Factor, PHF Veh/ap Peak-Hou

HCS 2010TM Version 6.90

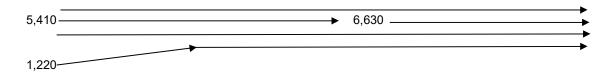
Generated: 5/25/2019 9:29 PM

Job: SW 10th Street SIMR

Analyst: AECOM

Location: Seg 8: I-95 Southbound On-Ramp from SW 10th Street EB & WB Analysis Period: PM Peak Hour

Analysis Year: 2020 Build 1



Ramp Tr % = 2%
Downstream Freeway Tr % = 3%

Freeway f_{HV} = 1/(1+P_T(E_T-1)+P_R(E_R-1)) = 0.985 Ramp f_{HV} = 1/(1+P_T(E_T-1)+P_R(E_R-1)) = 0.9901

flat terrain $E_T = 1.5$ RV % = 0

Driver Population adj. $f_P = 1.000$

 $V_{fr} = = V_{fr}/(PHF)(f_{HV})(f_{P}) = V_{r} = = V_{r}/(PHF)(f_{HV})(f_{P}) = V_{f} = = V_{f}/(PHF)(f_{HV})(f_{P}) f_{P}) = V_{f}/(PHF)(f_{HV})(f_{P})($

7,084 pc/h 1,297 pc/h 5,780 pc/h

No. lanes upstream of ramp N = 3

<u>No. Ln</u>	Capacity Check (see Exhibits 25-3 and 25-7):	Maximum	Actual	V/c	LOS F?	
4	Fwy downstream of ramp (assume 70 mph free-flow speed) =	9,600	7,084	0.74	No	
3	Fwy upstream of ramp (assume 70 mph free-flow speed) =	7,200	5,780	0.80	No	
1	Capacity on On-Ramp (assume 45 mph free-flow speed) =	2,100	1,297	0.62	No	

BASIC F	REEWAY SE	GMENTS WORKSHEET				
		Site Information				
AECOM		Highway/Direction of Travel From/To	I-95 SB Seg 9-B	et 10th & Exit to Exp		
PM		Analysis Year	2020 Bu	uild 1		
h Street SIMR						
		Des.(N)	Pla	anning Data		
6630	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R	0.95 3 0			
	veh/h	General Terrain: Grade % Length Up/Down %	Level mi			
nents						
1.00		E _R	1.2			
1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.985			
		Calc Speed Adj and FFS				
	ft					
	ft	f_LW		mph		
4		f_{LC}		mph		
	ramps/mi	TRD Adjustment		mph		
70.0	mph	FFS	70.0	mph		
	mph					
Measures		Design (N)				
x f _{HV} x f _p) 1771 66.2	pc/h/ln mph		$f_{HV} \times f_p$)	pc/h/ln		
26.7	pc/mi/ln			mph		
D		Required Number of Lanes, N		pc/mi/ln		
		Factor Location				
S - Speed						
· ·		1'		f _{LW} - Exhibit 11-8		
	speed	E_T - Exhibits 11-10, 11-11, 11-13 f_{LC} - Exhibit 11-9				
	-	I '		TRD - Page 11-11		
our volume	- 1	LOS, S, FFS, v _p - Exhibits 11-2	2, 11-3			
	AECOM PM 6 Street SIMR 6630 6630 nents 1.00 1.5 4 70.0 Measures x f _{HV} x f _p) 1771 66.2 26.7 D S - Speed D - Density FFS - Free-flow BFFS - Base free	AECOM PM Street SIMR 6630 veh/h veh/day veh/h nents 1.00 1.5 ft ft ft 4 ramps/mi mph mph mph Measures x f _{HV} x f _p) 1771 pc/h/ln 66.2 mph 26.7 pc/mi/ln D S - Speed D - Density FFS - Free-flow speed BFFS - Base free-flow speed	AECOM PM Analysis Year Des.(N)	Site Information		

HCS 2010TM Version 6.90

Generated: 5/25/2019 9:39 PM

		RAMPS	S AND RAMI	P JUNCTI	ONS WO	RKS	HEET			
General Inf	ormation			Site Infor	mation					
Analyst			Fre	eway/Dir of Tr	avel	I-95 SE	3			
Agency or Compa	any AEC	COM		nction		Seg 10	- Diverge to	Express		
Date Performed				risdiction						
Analysis Time Pe			An	alysis Year		2020 B	uild 1			
	n SW 10th Stre	et SIMR								
nputs								ı		
Upstream Ad	lj Ramp	Freeway Numb	er of Lanes, N	4				Į.	Downstre	am Adj
		Ramp Number	of Lanes, N	1				Į.	Ramp	-
✓ Yes	☑ On	Acceleration La	ane Length, L _A						Yes	On
□No	Off	Deceleration La	ane Length L _D	300						
		Freeway Volum	- 5	6630					✓ No	Off
L _{up} =	4500 ft	Ramp Volume,	•	720				I	_ _{down} =	ft
чр			Flow Speed, S _{FF}	70.0						
$V_u =$	1220 veh/h							[V _D =	veh/h
		Ramp Free-Flo		45.0						
Conversion	to pc/h Un	der Base C	conditions		1		r			
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv		f_{HV}	f _p	/ = V/PHF	$= x f_{HV} x f_{p}$
Freeway	6630	0.95	Level	3	0	_	985	1.00	7(084
Ramp	720	0.92	Level	2	0		990	1.00		'90
UpStream	1220	0.92	Level	2	0		990	1.00		339
DownStream	1220	0.52	LCVCI			 °	330	1.00	10	000
		Merge Areas					D	iverge Areas		
Estimation	of V ₁₂				Estimation of v ₁₂					
	V ₁₂ = V ₁	_ (P)						V _R + (V _F - V _R	\P	
_		ation 13-6 or 1	12.7\		.=					
- _{EQ} =			•							
P _{FM} =	-	g Equation (E	KNIDIT 13-6)		P _{FD} =				ation (Exn	iibit 13-7)
/ ₁₂ =	pc/h				V ₁₂ =			34 pc/h		
V_3 or V_{av34}		(Equation 13-	14 or 13-17)		V ₃ or V _{av34} 1775 pc/h (Equation 13-14 or 13-17)					
0 4.0.	2,700 pc/h? ☐ Y€				Is V_3 or $V_{av34} > 2,700$ pc/h? \square Yes \checkmark No					
Is V_3 or $V_{av34} > 1$.5 * V ₁₂ /2 Ye				Is V ₃ or V _{av3}	₃₄ > 1.5		Yes ☑ No		
f Yes,V _{12a} =	pc/h 13-19	(Equation 13-	16, 13-18, or		If Yes,V _{12a} =	:		c/h (Equation	13-16, 13	3-18, or 13-
Capacity C		"			Capacit	v Ch	19 ocks)		
sapacity C	Actual		pacity	LOS F?	Capacit	y CII	Actual	Car	acity	LOS F?
	Actual		ipacity	LOOT:	V _F		7084	Exhibit 13-8	1	No
1/		E 1 11 11 40 0						_	+	
V_{FO}		Exhibit 13-8			$V_{FO} = V_{F}$	- v _R	6294	Exhibit 13-8	9600	No
					V_R		790	Exhibit 13-10	2100	No
Flow Enter	ing Merge II	nfluence Al	rea		Flow En	terin	g Diver	ge Influenc	e Area	
	Actual	Max D	esirable	Violation?			Actual	Max Desirabl	e	Violation?
V_{R12}		Exhibit 13-8			V ₁₂		3534	Exhibit 13-8	4400:AII	No
	rvice Deter	mination (i	not F)		Level of	Serv	vice Det	ermination	(if not	F)
D _R = 5.475 +	0.00734 v _R +	· 0.0078 V ₁₂ -	0.00627 L _A			D _R = 4	1.252 + 0.	0086 V ₁₂ - 0.0	009 L _D	
$D_{R} = (pc/mi/ln)$.0 (pc	/mi/ln)		_	
O _R = (pc/mi/ln) .OS = (Exhibit 13-2)							bit 13-2)			
					LOS = D Speed D	-		n		
Speed Determination										
M _S = (Exibit 13-11)					ľ		xhibit 13-	•		
	S _R = mph (Exhibit 13-11)).7 mph	(Exhibit	13-12)		
	Exhibit 13-11)					•	•			
$S_R = mph (E$	Exhibit 13-11) Exhibit 13-11)					l.5 mph	(Exhibit	13-12)		
$S_R = mph (E_0)$	•				$S_0 = 74$	-	•			

	BASIC F	REEWAY SE	GMENTS WORKSHEET				
General Information			Site Information				
Analyst Agency or Company Date Performed Analysis Time Period	AECOM PM		Highway/Direction of Travel From/To Jurisdiction Analysis Year	I-95 SB Seg 11-E 2020 Bu	Bet Off Exp Off Sample		
Project Description SW 10to	h Street SIMR						
✓ Oper.(LOS)			Des.(N)	Pla	nning Data		
Flow Inputs							
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D	5910	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain:	0.95 3 0 Level			
DDHV = AADT x K x D		veh/h	General Ferfalls. Grade % Length Up/Down %	mi			
Calculate Flow Adjustr	nents						
f _p E _T	1.00 1.5		E_{R} $f_{HV} = 1/[1+P_{T}(E_{T}-1)+P_{R}(E_{R}-1)]$	1.2 0.985			
Speed Inputs			Calc Speed Adj and FFS				
Lane Width		ft					
Rt-Side Lat. Clearance		ft	f_{LW}		mph		
Number of Lanes, N	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	Measures		Design (N)				
Operational (LOS) v _p = (V or DDHV) / (PHF x N : S D = v _p / S LOS	x f _{HV} x f _p) 1579 68.3 23.1 C	pc/h/ln mph pc/mi/ln	Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$ Required Number of Lanes, N	$f_{HV} \times f_p$)	pc/h/ln mph pc/mi/ln		
Glossary			Factor Location				
N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base freeur volume	-	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11		

HCS 2010TM Version 6.90

Generated: 5/25/2019 9:49 PM

Isha OW 40th Obrast Of	MD.						
Job: SW 10th Street SII Analyst: AECOM	MR						
lyen.							
Location:	0 40 - 1	05 0D 04	4 Dawn 4a Oan	l. D	FD 9 V	VD.	
Analysis Period:	PM Peak		f-Ramp to Sar	пріе к	Oau EB & V	<u>v</u> b	
Analysis Year:	2020 Bui					-	
, ,		 -				-	
		5.040					•
		5,910					→ 4,800
						1,110	
	PHF =	0.95			7	1,110	
	v _{fr} =	5,910					
	v _r =	1,110					
	$v_f =$	4,800					
Upstream Freeway	•	3%					
	Tr % =	2%					
Downstream Freeway	Tr % =	3%	_				
Freeway	$f_{HV} =$	1/(1+P _⊤	$(E_T-1)+P_R(E_R$	₁-1)) =		0.985	_
Ramp	$f_{HV} =$	1/(1+P _⊤	$(E_T-1)+P_R(E_R$	₍ -1)) =		0.9901	_
flat terrain	-	1.5					_
	RV % =	_					
Driver Population adj.	- -	1.000		_			
	$V_{fr} =$	$=v_{fr}/(PH$	$F)(f_{HV})(f_{P}) =$		6,314	pc/h	
	$V_r =$	=v _r /(PH	$F)(f_{HV})(f_{P}) =$		1,180	pc/h	
	$V_f =$	=v _f /(PHI	$F)(f_{HV})(f_{P}) =$		5,128	pc/h	
No. lanes upstream of ramp	N =	4					_
Average Freeway D	oneity I	Inetroan	of Divorgo	1600	Equation	13 26).	
Average i reeway L	ensity C	politali	ii oi biveige	(366	Lquation	13-20).	
$D = 0.0175 (V_{fr}/N) =$	27.6	pc/ln					
LOS in the Diverge	Area (fr		sity and Exh	nibit 1	3-2) =		
		С					
No. Ln Capacity Check (se	e Exhib	its 13-2.	13-8 and 13	3.10)	Maximum	Actual	LOS F?
4 Fwy upstream of ramp (a	assume 70) mph free	-flow speed) =		9,600	6,314	No
3 Fwy downstream of ram	, ,	•	. ,) =	7,200	5,128	
1 Capacity on Off-Ramp (a	assume 45	mpn free	-now speed) =		2,100	1,180	INO

	BASIC F	REEWAY SE	GMENTS WORKSHEET				
General Information			Site Information				
Analyst Agency or Company Date Performed Analysis Time Period	AECOM PM		Highway/Direction of Travel From/To Jurisdiction Analysis Year	I-95 SB Seg 13-E 2020 Bu	Bet Off & On Ramps ild 1		
Project Description SW 10th							
✓ Oper.(LOS)			Des.(N)	∐Pla	nning Data		
Flow Inputs							
Volume, V AADT Peak-Hr Prop. of AADT, K	4800	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R	0.95 3 0			
Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	General Terrain: Grade % Length Up/Down %	Level mi			
Calculate Flow Adjustr	nents						
f _p E _T	1.00 1.5		E_{R} $f_{HV} = 1/[1+P_{T}(E_{T}-1)+P_{R}(E_{R}-1)]$	1.2 0.985			
Speed Inputs			Calc Speed Adj and FFS				
Lane Width		ft					
Rt-Side Lat. Clearance		ft	f_{LW}		mph		
Number of Lanes, N	3		f _{LC}		mph		
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph		
FFS (measured)	70.0	mph	FFS	70.0	mph		
Base free-flow Speed, BFFS		mph			·		
LOS and Performance	Measures		Design (N)				
Operational (LOS) v _p = (V or DDHV) / (PHF x N s S D = v _p / S LOS	x f _{HV} x f _p) 1709 67.0 25.5 C	pc/h/ln mph pc/mi/ln	Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \times N \times S)$ $D = v_p / S$ Required Number of Lanes, N	$f_{HV} \times f_p$)	pc/h/ln mph pc/mi/ln		
Glossary			Factor Location				
N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service DDHV - Directional design ho	S - Speed D - Density FFS - Free-flow BFFS - Base freedour volume	-	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 11- f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11		

HCS 2010TM Version 6.90

Generated: 5/25/2019 9:59 PM

		F	REEWAY	/ WEAV	ING WOF	RKSHEE	T				
Gener	al Information	on			Site Information						
Analyst Agency/C Date Perf Analysis		Freeway/Dir of Travel Weaving Segment Location Analysis Year I-95 SB Seg 14- Bet Sample & Copans 2020 Build 1									
	escription SW 10tl	n Street SIMF	?								
Inputs					1						
Weaving Weaving Freeway	configuration number of lanes, N segment length, L _s free-flow speed, FF	S S		2520ft 70 mph	Segment typ Freeway min Freeway ma: Terrain type	imum speed			Freeway 15 2400 Leve		
Conve	ersions to po	1	1	1	i				(")		
	V (veh/h)	PHF	Truck (%)	RV (%)	E _T	E _R	f _{HV}	fp	v (pc/h)		
V _{FF}	4170	0.95	3	0	1.5	1.2	0.985	1.00	4455		
V_{RF}	1420	0.92	2	0	1.5	1.2	0.990	1.00	1559		
V_{FR}	630	0.92	2	0	1.5	1.2	0.990	1.00	692		
V_{RR}	0	0.95	0	0	1.5	1.2	1.000	1.00	0		
V_{NW}	4455				V =				6706		
V_W	2251										
VR	0.336										
Config	guration Cha	aracteris	tics		1						
Minimum	maneuver lanes, I	N_{WL}		2 lc	Minimum weaving lane changes, LC _{MIN} 2						
Interchan	ige density, ID			0.7 int/mi	Weaving lane changes, LC_W						
Minimum	RF lane changes,	LC_RF		1 lc/pc	Non-weaving lane changes, LC _{NW}						
Minimum	FR lane changes,	LC_FR		1 lc/pc	Total lane changes, LC _{ALL} 42						
Minimum	RR lane changes,	LC_{RR}		lc/pc	Non-weaving vehicle index, I _{NW} 78						
Weavi	ng Segment	Speed,	Density,	Level of	Service,	and Cap	acity				
Weaving segment flow rate, v 6618 veh/h					Weaving intensity factor, W						
Weaving segment capacity, c _w 7044 veh/h								48.8 mph			
Weaving segment v/c ratio 0.939				Average weaving speed, S _W				56.1 mph			
Weaving segment density, D 34.4 pc/mi/ln				Average non-weaving speed, S_{NW} 45.7 m				45.7 mph			
Level of S	Service, LOS			D	Maximum weaving length, L _{MAX} 5970 ft						
Notes					-						

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

HCS 2010TM Version 6.90