

ATTACHMENT B | YEAR 2019 EXISTING TRAFFIC
OPERATIONS WORKSHEETS

Intersection	
Intersection Delay, s/veh	11.9
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	136	10	2	2	10	7	2	108	4	7	108	188
Future Vol, veh/h	136	10	2	2	10	7	2	108	4	7	108	188
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Heavy Vehicles, %	2	10	0	50	10	14	50	3	25	14	2	5
Mvmt Flow	184	14	3	3	14	9	3	146	5	9	146	254
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	11.1	9.7	11	12.8
HCM LOS	B	A	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	2%	92%	11%	2%
Vol Thru, %	95%	7%	53%	36%
Vol Right, %	4%	1%	37%	62%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	114	148	19	303
LT Vol	2	136	2	7
Through Vol	108	10	10	108
RT Vol	4	2	7	188
Lane Flow Rate	154	200	26	409
Geometry Grp	1	1	1	1
Degree of Util (X)	0.255	0.311	0.046	0.526
Departure Headway (Hd)	5.959	5.601	6.388	4.625
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	607	644	563	770
Service Time	3.959	3.611	4.404	2.715
HCM Lane V/C Ratio	0.254	0.311	0.046	0.531
HCM Control Delay	11	11.1	9.7	12.8
HCM Lane LOS	B	B	A	B
HCM 95th-tile Q	1	1.3	0.1	3.1

Intersection												
Int Delay, s/veh	3.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	42	3	6	1	4	44	9	323	3	68	368	170
Future Vol, veh/h	42	3	6	1	4	44	9	323	3	68	368	170
Conflicting Peds, #/hr	0	0	3	3	0	0	1	0	4	4	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	10	0	0	0	0	14	11	3	0	18	4	11
Mvmt Flow	53	4	8	1	5	55	11	404	4	85	460	213

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	1196	1172	571	1178	1276	410	674	0	0	412	0	0
Stage 1	738	738	-	432	432	-	-	-	-	-	-	-
Stage 2	458	434	-	746	844	-	-	-	-	-	-	-
Critical Hdwy	7.2	6.5	6.2	7.1	6.5	6.34	4.21	-	-	4.28	-	-
Critical Hdwy Stg 1	6.2	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.2	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.59	4	3.3	3.5	4	3.426	2.299	-	-	2.362	-	-
Pot Cap-1 Maneuver	157	194	524	169	168	616	876	-	-	1066	-	-
Stage 1	397	427	-	606	586	-	-	-	-	-	-	-
Stage 2	568	585	-	409	382	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	123	165	522	144	143	614	875	-	-	1062	-	-
Mov Cap-2 Maneuver	123	165	-	144	143	-	-	-	-	-	-	-
Stage 1	390	370	-	594	574	-	-	-	-	-	-	-
Stage 2	504	573	-	345	331	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	52.3		14		0.2		1	
HCM LOS	F		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	875	-	-	137	460	1062	-	-
HCM Lane V/C Ratio	0.013	-	-	0.465	0.133	0.08	-	-
HCM Control Delay (s)	9.2	0	-	52.3	14	8.7	0	-
HCM Lane LOS	A	A	-	F	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	2.1	0.5	0.3	-	-

Intersection						
Int Delay, s/veh	1.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↖	↖	
Traffic Vol, veh/h	0	100	0	409	506	0
Future Vol, veh/h	0	100	0	409	506	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	79	79	79	79	79	79
Heavy Vehicles, %	0	11	0	5	6	0
Mvmt Flow	0	127	0	518	641	0

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	-	641	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.31	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.399	-	-	-	-
Pot Cap-1 Maneuver	0	459	0	-	-	0
Stage 1	0	-	0	-	-	0
Stage 2	0	-	0	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	-	459	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	15.8	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT EBLn1	SBT
Capacity (veh/h)	- 459	-
HCM Lane V/C Ratio	- 0.276	-
HCM Control Delay (s)	- 15.8	-
HCM Lane LOS	- C	-
HCM 95th %tile Q(veh)	- 1.1	-

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			W	W	
Traffic Vol, veh/h	0	0	4	253	327	96
Future Vol, veh/h	0	0	4	253	327	96
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	0	0	0	8	8	11
Mvmt Flow	0	0	5	298	385	113

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	750	442	498	0	-	0
Stage 1	442	-	-	-	-	-
Stage 2	308	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	382	620	1076	-	-	-
Stage 1	652	-	-	-	-	-
Stage 2	750	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	380	620	1076	-	-	-
Mov Cap-2 Maneuver	380	-	-	-	-	-
Stage 1	648	-	-	-	-	-
Stage 2	750	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1076	-	-	-	-
HCM Lane V/C Ratio	0.004	-	-	-	-
HCM Control Delay (s)	8.4	0	0	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-

Intersection						
Int Delay, s/veh	1.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↔	↔	
Traffic Vol, veh/h	1	39	37	216	384	1
Future Vol, veh/h	1	39	37	216	384	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	0	5	5	7	9	0
Mvmt Flow	1	46	44	254	452	1








Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	795	453	453	0	0
Stage 1	453	-	-	-	-
Stage 2	342	-	-	-	-
Critical Hdwy	6.4	6.25	4.15	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.345	2.245	-	-
Pot Cap-1 Maneuver	359	601	1092	-	-
Stage 1	645	-	-	-	-
Stage 2	724	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	342	601	1092	-	-
Mov Cap-2 Maneuver	342	-	-	-	-
Stage 1	615	-	-	-	-
Stage 2	724	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.6	1.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1092	-	590	-	-
HCM Lane V/C Ratio	0.04	-	0.08	-	-
HCM Control Delay (s)	8.4	0	11.6	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.3	-	-

Queues
6: I-5 SB On Ramp & Lewis River Rd

Existing AM Peak Hour
07/03/2019




















							
Lane Group	EBL	EBT	WBL	WBT	WBR	SBL	SBT
Lane Group Flow (vph)	41	434	333	587	258	184	196
v/c Ratio	0.07	0.25	0.40	0.45	0.18	0.69	0.72
Control Delay	4.8	19.5	8.9	14.1	0.2	72.1	73.8
Queue Delay	0.0	0.0	0.1	1.0	0.0	0.0	0.0
Total Delay	4.8	19.5	8.9	15.2	0.2	72.1	73.8
Queue Length 50th (ft)	7	103	102	206	0	173	185
Queue Length 95th (ft)	20	167	m174	m484	m0	230	244
Internal Link Dist (ft)		147		400			78
Turn Bay Length (ft)	100		150				
Base Capacity (vph)	643	1734	884	1310	1461	461	471
Starvation Cap Reductn	0	0	49	454	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.25	0.40	0.69	0.18	0.40	0.42

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM 2010 Signalized Intersection Summary
 6: I-5 SB On Ramp & Lewis River Rd

Existing AM Peak Hour
 07/03/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	261	113	286	505	222	0	0	0	158	168	1
Future Volume (veh/h)	35	261	113	286	505	222	0	0	0	158	168	1
Number	1	6	16	5	2	12				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1792	1803	1900	1792	1792	1759				1776	1728	1900
Adj Flow Rate, veh/h	41	303	131	333	587	0				184	195	1
Adj No. of Lanes	1	2	0	1	1	1				1	1	0
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86				0.86	0.86	0.86
Percent Heavy Veh, %	6	6	6	6	6	8				7	10	7
Cap, veh/h	682	1636	692	784	1369	1142				237	240	1
Arrive On Green	0.02	0.70	0.70	0.14	1.00	0.00				0.14	0.14	0.14
Sat Flow, veh/h	1707	2345	992	1707	1792	1495				1691	1718	9
Grp Volume(v), veh/h	41	219	215	333	587	0				184	0	196
Grp Sat Flow(s),veh/h/ln	1707	1713	1624	1707	1792	1495				1691	0	1727
Q Serve(g_s), s	0.8	6.7	6.9	9.0	0.0	0.0				15.7	0.0	16.5
Cycle Q Clear(g_c), s	0.8	6.7	6.9	9.0	0.0	0.0				15.7	0.0	16.5
Prop In Lane	1.00		0.61	1.00		1.00				1.00		0.01
Lane Grp Cap(c), veh/h	682	1195	1133	784	1369	1142				237	0	242
V/C Ratio(X)	0.06	0.18	0.19	0.42	0.43	0.00				0.78	0.00	0.81
Avail Cap(c_a), veh/h	836	1195	1133	1110	1369	1142				462	0	472
HCM Platoon Ratio	1.00	1.00	1.00	1.67	1.67	1.67				1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.79	0.79	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	3.7	7.9	7.9	4.6	0.0	0.0				62.2	0.0	62.6
Incr Delay (d2), s/veh	0.0	0.3	0.4	0.4	0.8	0.0				7.6	0.0	8.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	3.2	3.2	4.2	0.3	0.0				7.9	0.0	8.5
LnGrp Delay(d),s/veh	3.8	8.2	8.3	4.9	0.8	0.0				69.8	0.0	71.5
LnGrp LOS	A	A	A	A	A					E		E
Approach Vol, veh/h		475			920						380	
Approach Delay, s/veh		7.8			2.3						70.7	
Approach LOS		A			A						E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6						
Phs Duration (G+Y+Rc), s	6.5	118.5		25.0	16.4	108.6						
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0						
Max Green Setting (Gmax), s	16.0	81.0		41.0	41.0	56.0						
Max Q Clear Time (g_c+I1), s	2.8	2.0		18.5	11.0	8.9						
Green Ext Time (p_c), s	0.0	4.7		2.5	1.4	2.4						
Intersection Summary												
HCM 2010 Ctrl Delay				18.4								
HCM 2010 LOS				B								

Queues
7: I-5 NB Off Ramp & Lewis River Rd

Existing AM Peak Hour
07/03/2019
























Lane Group	EBL	EBT	WBT	NBT	NBR	SBL	SBR
Lane Group Flow (vph)	172	315	751	340	229	16	258
v/c Ratio	0.62	0.26	0.51	0.91	0.46	0.15	0.76
Control Delay	49.5	43.3	3.3	85.8	8.5	68.7	22.6
Queue Delay	0.0	0.0	0.2	8.6	0.0	0.0	0.4
Total Delay	49.5	43.3	3.5	94.4	8.5	68.7	23.0
Queue Length 50th (ft)	131	123	12	322	0	15	0
Queue Length 95th (ft)	208	191	33	#463	58	39	75
Internal Link Dist (ft)		400	67	136			
Turn Bay Length (ft)	150					50	
Base Capacity (vph)	327	1226	1585	387	513	123	349
Starvation Cap Reductn	0	0	266	0	0	0	0
Spillback Cap Reductn	0	0	5	31	0	0	6
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.26	0.57	0.96	0.45	0.13	0.75

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis
7: I-5 NB Off Ramp & Lewis River Rd

Existing AM Peak Hour
07/03/2019

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		 			 								
Traffic Volume (vph)	148	271	0	0	528	118	263	29	197	14	0	222	
Future Volume (vph)	148	271	0	0	528	118	263	29	197	14	0	222	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	4.0			6.5			4.0	4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95			0.95			1.00	1.00	1.00		1.00	
Frbp, ped/bikes	1.00	1.00			0.99			1.00	1.00	1.00		1.00	
Flpb, ped/bikes	1.00	1.00			1.00			1.00	1.00	1.00		1.00	
Frt	1.00	1.00			0.97			1.00	0.85	1.00		0.85	
Flt Protected	0.95	1.00			1.00			0.96	1.00	0.95		1.00	
Satd. Flow (prot)	1686	3406			3314			1653	1442	1687		1509	
Flt Permitted	0.22	1.00			1.00			0.96	1.00	0.95		1.00	
Satd. Flow (perm)	384	3406			3314			1653	1442	1687		1509	
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	
Adj. Flow (vph)	172	315	0	0	614	137	306	34	229	16	0	258	
RTOR Reduction (vph)	0	0	0	0	11	0	0	0	177	0	0	241	
Lane Group Flow (vph)	172	315	0	0	740	0	0	340	52	16	0	17	
Confl. Peds. (#/hr)	3		2	2		3							
Confl. Bikes (#/hr)						1							
Heavy Vehicles (%)	7%	6%	0%	0%	5%	7%	8%	28%	12%	7%	0%	7%	
Turn Type	custom	NA			NA		Split	NA	Prot	Prot		Prot	
Protected Phases	1	6			2		3	3	3	4		4	
Permitted Phases	2												
Actuated Green, G (s)	55.0	52.4			68.9			33.8	33.8	9.6		9.6	
Effective Green, g (s)	55.0	52.4			68.9			33.8	33.8	9.6		9.6	
Actuated g/C Ratio	0.37	0.35			0.46			0.23	0.23	0.06		0.06	
Clearance Time (s)	4.0	4.0						4.0	4.0	4.0		4.0	
Vehicle Extension (s)	2.5	3.0						2.5	2.5	3.5		3.5	
Lane Grp Cap (vph)	272	1189			1522			372	324	107		96	
v/s Ratio Prot	c0.06	0.09			c0.22			c0.21	0.04	0.01		c0.01	
v/s Ratio Perm	c0.17												
v/c Ratio	0.63	0.26			0.49			0.91	0.16	0.15		0.17	
Uniform Delay, d1	34.7	35.0			28.2			56.7	46.7	66.3		66.4	
Progression Factor	1.26	1.15			0.13			1.00	1.00	1.00		1.00	
Incremental Delay, d2	4.0	0.5			0.1			26.2	0.2	0.8		1.0	
Delay (s)	47.7	40.7			3.7			82.9	46.9	67.1		67.4	
Level of Service	D	D			A			F	D	E		E	
Approach Delay (s)		43.2			3.7			68.4				67.4	
Approach LOS		D			A			E				E	
Intersection Summary													
HCM 2000 Control Delay			39.0									HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio			0.64										
Actuated Cycle Length (s)			150.0									Sum of lost time (s)	22.5
Intersection Capacity Utilization			62.2%									ICU Level of Service	B
Analysis Period (min)			15										
c Critical Lane Group													













Queues
8: E CC St & Lewis River Rd

Existing AM Peak Hour
07/03/2019

	→	↖	←	↙	↗
Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	518	22	411	284	61
v/c Ratio	0.23	0.30	0.46	0.85	0.15
Control Delay	2.4	78.8	51.0	81.3	0.8
Queue Delay	0.3	0.0	0.0	0.0	0.0
Total Delay	2.7	78.8	51.0	81.3	0.8
Queue Length 50th (ft)	27	21	184	269	0
Queue Length 95th (ft)	26	52	259	370	0
Internal Link Dist (ft)	67		149		
Turn Bay Length (ft)		75		100	
Base Capacity (vph)	2286	170	902	389	446
Starvation Cap Reductn	1115	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.44	0.13	0.46	0.73	0.14
Intersection Summary					

HCM Signalized Intersection Capacity Analysis
8: E CC St & Lewis River Rd

Existing AM Peak Hour
07/03/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↖	↑↑		↖		↖			
Traffic Volume (vph)	0	365	117	20	382	0	264	0	57	0	0	0
Future Volume (vph)	0	365	117	20	382	0	264	0	57	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	6.5		4.0		4.0			
Lane Util. Factor		0.95		1.00	0.95		1.00		1.00			
Frbp, ped/bikes		1.00		1.00	1.00		1.00		1.00			
Flpb, ped/bikes		1.00		1.00	1.00		1.00		1.00			
Frt		0.96		1.00	1.00		1.00		0.85			
Flt Protected		1.00		0.95	1.00		0.95		1.00			
Satd. Flow (prot)		3221		1504	3406		1719		1583			
Flt Permitted		1.00		0.95	1.00		0.95		1.00			
Satd. Flow (perm)		3221		1504	3406		1719		1583			
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	392	126	22	411	0	284	0	61	0	0	0
RTOR Reduction (vph)	0	15	0	0	0	0	0	0	49	0	0	0
Lane Group Flow (vph)	0	503	0	22	411	0	284	0	12	0	0	0
Confl. Peds. (#/hr)	2					2						
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	0%	6%	12%	20%	6%	0%	5%	0%	2%	0%	0%	0%
Turn Type		NA		Prot	NA		Prot		Prot			
Protected Phases		4 6 3		5	2		8		8			
Permitted Phases												
Actuated Green, G (s)		103.8		5.1	39.8		29.1		29.1			
Effective Green, g (s)		103.8		5.1	39.8		29.1		29.1			
Actuated g/C Ratio		0.69		0.03	0.27		0.19		0.19			
Clearance Time (s)				4.0	6.5		4.0		4.0			
Vehicle Extension (s)				2.5	3.8		1.5		1.5			
Lane Grp Cap (vph)		2228		51	903		333		307			
v/s Ratio Prot		c0.16		c0.01	c0.12		c0.17		0.01			
v/s Ratio Perm												
v/c Ratio		0.23		0.43	0.46		0.85		0.04			
Uniform Delay, d1		8.4		71.0	46.0		58.4		49.1			
Progression Factor		0.27		1.00	1.00		1.00		1.00			
Incremental Delay, d2		0.1		4.2	1.7		18.0		0.0			
Delay (s)		2.3		75.2	47.7		76.4		49.1			
Level of Service		A		E	D		E		D			
Approach Delay (s)		2.3			49.1			71.5			0.0	
Approach LOS		A			D			E			A	
Intersection Summary												
HCM 2000 Control Delay			36.4			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			0.46									
Actuated Cycle Length (s)			150.0			Sum of lost time (s)			22.5			
Intersection Capacity Utilization			42.5%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	1	2	7	11	0	9	25	391	6	13	384	6
Future Vol, veh/h	1	2	7	11	0	9	25	391	6	13	384	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	1	1	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	50	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	0	50	14	18	0	22	4	6	17	0	6	0
Mvmt Flow	1	2	8	13	0	10	29	449	7	15	441	7

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	758	990	445	992	990	229	448	0	0	457	0	0
Stage 1	475	475	-	512	512	-	-	-	-	-	-	-
Stage 2	283	515	-	480	478	-	-	-	-	-	-	-
Critical Hdwy	7.3	7.25	6.41	7.57	6.5	7.23	4.16	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	6.25	-	6.77	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	6.25	-	6.37	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.475	3.433	3.671	4	3.509	2.238	-	-	2.2	-	-
Pot Cap-1 Maneuver	313	190	583	194	248	723	1098	-	-	1114	-	-
Stage 1	574	467	-	481	540	-	-	-	-	-	-	-
Stage 2	706	445	-	530	559	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	299	182	583	184	238	722	1098	-	-	1113	-	-
Mov Cap-2 Maneuver	299	182	-	184	238	-	-	-	-	-	-	-
Stage 1	559	461	-	468	525	-	-	-	-	-	-	-
Stage 2	678	433	-	513	552	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	14.8		19.2		0.5		0.3	
HCM LOS	B		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1098	-	-	380	277	1113	-	-
HCM Lane V/C Ratio	0.026	-	-	0.03	0.083	0.013	-	-
HCM Control Delay (s)	8.4	-	-	14.8	19.2	8.3	-	-
HCM Lane LOS	A	-	-	B	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.1	0.3	0	-	-

Intersection	
Intersection Delay, s/veh	9.7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	123	7	0	3	4	9	3	229	6	9	131	104
Future Vol, veh/h	123	7	0	3	4	9	3	229	6	9	131	104
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles, %	1	14	0	0	25	0	0	1	17	0	0	2
Mvmt Flow	135	8	0	3	4	10	3	252	7	10	144	114
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9.8	8.2	10	9.5
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %		1%	95%	19%
Vol Thru, %		96%	5%	25%
Vol Right, %		3%	0%	56%
Sign Control		Stop	Stop	Stop
Traffic Vol by Lane		238	130	16
LT Vol		3	123	3
Through Vol		229	7	4
RT Vol		6	0	9
Lane Flow Rate		262	143	18
Geometry Grp		1	1	1
Degree of Util (X)		0.335	0.21	0.024
Departure Headway (Hd)		4.607	5.295	4.994
Convergence, Y/N		Yes	Yes	Yes
Cap		779	674	710
Service Time		2.649	3.358	3.073
HCM Lane V/C Ratio		0.336	0.212	0.025
HCM Control Delay		10	9.8	8.2
HCM Lane LOS		A	A	A
HCM 95th-tile Q		1.5	0.8	0.1

Intersection												
Int Delay, s/veh	8.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	64	18	10	6	4	169	5	443	8	81	285	69
Future Vol, veh/h	64	18	10	6	4	169	5	443	8	81	285	69
Conflicting Peds, #/hr	0	0	2	2	0	0	3	0	1	1	0	3
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	2	0	0	0	25	4	0	1	0	20	1	22
Mvmt Flow	68	19	11	6	4	180	5	471	9	86	303	73

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1093	1006	345	1016	1038	477	379	0	0	481	0	0
Stage 1	515	515	-	487	487	-	-	-	-	-	-	-
Stage 2	578	491	-	529	551	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.5	6.2	7.1	6.75	6.24	4.1	-	-	4.3	-	-
Critical Hdwy Stg 1	6.12	5.5	-	6.1	5.75	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.5	-	6.1	5.75	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4	3.3	3.5	4.225	3.336	2.2	-	-	2.38	-	-
Pot Cap-1 Maneuver	192	243	702	218	210	584	1191	-	-	994	-	-
Stage 1	543	538	-	566	514	-	-	-	-	-	-	-
Stage 2	501	552	-	537	480	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	118	214	699	182	185	583	1188	-	-	993	-	-
Mov Cap-2 Maneuver	118	214	-	182	185	-	-	-	-	-	-	-
Stage 1	538	477	-	562	510	-	-	-	-	-	-	-
Stage 2	342	548	-	450	425	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	71.2		15.9		0.1		1.7	
HCM LOS	F		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1188	-	-	144	520	993	-	-
HCM Lane V/C Ratio	0.004	-	-	0.68	0.366	0.087	-	-
HCM Control Delay (s)	8	0	-	71.2	15.9	9	0	-
HCM Lane LOS	A	A	-	F	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	3.8	1.7	0.3	-	-

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↖	↖	
Traffic Vol, veh/h	0	57	0	676	378	0
Future Vol, veh/h	0	57	0	676	378	0
Conflicting Peds, #/hr	3	0	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	15	0	2	6	0
Mvmt Flow	0	61	0	727	406	0

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	-	406	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.35	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.435	-	-	-	-
Pot Cap-1 Maneuver	0	618	0	-	-	0
Stage 1	0	-	0	-	-	0
Stage 2	0	-	0	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	-	618	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.5	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT EBLn1	SBT
Capacity (veh/h)	- 618	-
HCM Lane V/C Ratio	- 0.099	-
HCM Control Delay (s)	- 11.5	-
HCM Lane LOS	- B	-
HCM 95th %tile Q(veh)	- 0.3	-

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			W	W	
Traffic Vol, veh/h	0	0	2	281	484	55
Future Vol, veh/h	0	0	2	281	484	55
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	3	5	15
Mvmt Flow	0	0	2	305	526	60

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	865	556	586	0	-	0
Stage 1	556	-	-	-	-	-
Stage 2	309	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	327	534	999	-	-	-
Stage 1	578	-	-	-	-	-
Stage 2	749	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	326	534	999	-	-	-
Mov Cap-2 Maneuver	326	-	-	-	-	-
Stage 1	577	-	-	-	-	-
Stage 2	749	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	999	-	-	-	-
HCM Lane V/C Ratio	0.002	-	-	-	-
HCM Control Delay (s)	8.6	0	0	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-

Intersection						
Int Delay, s/veh	0.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			W	W	
Traffic Vol, veh/h	0	28	35	246	511	2
Future Vol, veh/h	0	28	35	246	511	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	4	0	4	5	0
Mvmt Flow	0	30	38	267	555	2








Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	899	556	557	0	-	0
Stage 1	556	-	-	-	-	-
Stage 2	343	-	-	-	-	-
Critical Hdwy	6.4	6.24	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.336	2.2	-	-	-
Pot Cap-1 Maneuver	312	527	1024	-	-	-
Stage 1	578	-	-	-	-	-
Stage 2	723	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	298	527	1024	-	-	-
Mov Cap-2 Maneuver	298	-	-	-	-	-
Stage 1	553	-	-	-	-	-
Stage 2	723	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.2	1.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1024	-	527	-	-
HCM Lane V/C Ratio	0.037	-	0.058	-	-
HCM Control Delay (s)	8.7	0	12.2	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-




















Queues
6: I-5 SB On Ramp & Lewis River Rd

Existing PM Peak Hour
07/03/2019

							
Lane Group	EBL	EBT	WBL	WBT	WBR	SBL	SBT
Lane Group Flow (vph)	50	654	317	394	245	313	192
v/c Ratio	0.07	0.39	0.50	0.33	0.16	0.80	0.48
Control Delay	7.7	24.5	16.5	15.4	0.2	70.5	54.3
Queue Delay	0.0	0.0	0.0	0.8	0.0	0.0	0.0
Total Delay	7.7	24.5	16.5	16.2	0.2	70.5	54.3
Queue Length 50th (ft)	13	190	125	195	0	299	169
Queue Length 95th (ft)	32	295	245	312	0	381	230
Internal Link Dist (ft)		147		400			78
Turn Bay Length (ft)	100		150				
Base Capacity (vph)	743	1698	697	1192	1534	477	488
Starvation Cap Reductn	0	0	8	492	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.39	0.46	0.56	0.16	0.66	0.39
Intersection Summary							

HCM 2010 Signalized Intersection Summary
6: I-5 SB On Ramp & Lewis River Rd

Existing PM Peak Hour
07/03/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	48	416	212	304	378	235	0	0	0	300	184	0
Future Volume (veh/h)	48	416	212	304	378	235	0	0	0	300	184	0
Number	1	6	16	5	2	12				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1875	1900	1792	1792	1845				1845	1792	1900
Adj Flow Rate, veh/h	50	433	221	317	394	0				312	192	0
Adj No. of Lanes	1	2	0	1	1	1				1	1	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96				0.96	0.96	0.96
Percent Heavy Veh, %	0	1	1	6	6	3				3	6	3
Cap, veh/h	785	1438	727	607	1256	1099				355	362	0
Arrive On Green	0.02	0.63	0.63	0.15	1.00	0.00				0.20	0.20	0.00
Sat Flow, veh/h	1810	2290	1158	1707	1792	1568				1757	1792	0
Grp Volume(v), veh/h	50	336	318	317	394	0				312	192	0
Grp Sat Flow(s),veh/h/ln	1810	1781	1667	1707	1792	1568				1757	1792	0
Q Serve(g_s), s	1.2	13.2	13.4	10.8	0.0	0.0				26.4	14.6	0.0
Cycle Q Clear(g_c), s	1.2	13.2	13.4	10.8	0.0	0.0				26.4	14.6	0.0
Prop In Lane	1.00		0.69	1.00		1.00				1.00		0.00
Lane Grp Cap(c), veh/h	785	1118	1047	607	1256	1099				355	362	0
V/C Ratio(X)	0.06	0.30	0.30	0.52	0.31	0.00				0.88	0.53	0.00
Avail Cap(c_a), veh/h	940	1118	1047	874	1256	1099				471	480	0
HCM Platoon Ratio	1.00	1.00	1.00	1.67	1.67	1.67				1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.83	0.83	0.00				1.00	1.00	0.00
Uniform Delay (d), s/veh	6.2	13.1	13.1	7.9	0.0	0.0				59.2	54.6	0.0
Incr Delay (d2), s/veh	0.0	0.7	0.7	0.7	0.5	0.0				15.4	1.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	6.7	6.4	5.0	0.2	0.0				14.3	7.4	0.0
LnGrp Delay(d),s/veh	6.2	13.7	13.8	8.6	0.5	0.0				74.6	56.3	0.0
LnGrp LOS	A	B	B	A	A					E	E	
Approach Vol, veh/h		704			711						504	
Approach Delay, s/veh		13.3			4.1						67.6	
Approach LOS		B			A						E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6						
Phs Duration (G+Y+Rc), s	6.9	111.2		34.9	18.0	100.1						
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0						
Max Green Setting (Gmax), s	16.0	84.0		41.0	38.0	62.0						
Max Q Clear Time (g_c+I1), s	3.2	2.0		28.4	12.8	15.4						
Green Ext Time (p_c), s	0.1	2.8		2.5	1.3	3.8						
Intersection Summary												
HCM 2010 Ctrl Delay				24.2								
HCM 2010 LOS				C								

Queues
7: I-5 NB Off Ramp & Lewis River Rd

Existing PM Peak Hour
07/03/2019
























Lane Group	EBL	EBT	WBT	NBT	NBR	SBL	SBR
Lane Group Flow (vph)	228	525	683	334	443	31	137
v/c Ratio	0.70	0.50	0.53	0.77	0.62	0.27	0.57
Control Delay	51.9	57.5	6.3	65.6	7.5	73.4	19.3
Queue Delay	0.0	0.0	0.3	0.0	0.2	0.0	0.0
Total Delay	51.9	57.5	6.6	65.6	7.7	73.4	19.3
Queue Length 50th (ft)	197	265	7	308	0	30	0
Queue Length 95th (ft)	191	341	12	412	90	67	67
Internal Link Dist (ft)		400	67	136			
Turn Bay Length (ft)	150					50	
Base Capacity (vph)	359	1042	1388	495	762	116	241
Starvation Cap Reductn	0	0	232	0	0	0	0
Spillback Cap Reductn	0	25	0	0	38	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.52	0.59	0.67	0.61	0.27	0.57

Intersection Summary

HCM Signalized Intersection Capacity Analysis
7: I-5 NB Off Ramp & Lewis River Rd

Existing PM Peak Hour
07/03/2019

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		 			 								
Traffic Volume (vph)	217	499	0	0	532	117	255	63	421	29	0	130	
Future Volume (vph)	217	499	0	0	532	117	255	63	421	29	0	130	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	4.0			6.5			4.0	4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95			0.95			1.00	1.00	1.00		1.00	
Frbp, ped/bikes	1.00	1.00			1.00			1.00	1.00	1.00		1.00	
Flpb, ped/bikes	1.00	1.00			1.00			1.00	1.00	1.00		1.00	
Frt	1.00	1.00			0.97			1.00	0.85	1.00		0.85	
Flt Protected	0.95	1.00			1.00			0.96	1.00	0.95		1.00	
Satd. Flow (prot)	1752	3539			3263			1724	1553	1626		1568	
Flt Permitted	0.23	1.00			1.00			0.96	1.00	0.95		1.00	
Satd. Flow (perm)	418	3539			3263			1724	1553	1626		1568	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Adj. Flow (vph)	228	525	0	0	560	123	268	66	443	31	0	137	
RTOR Reduction (vph)	0	0	0	0	11	0	0	0	332	0	0	127	
Lane Group Flow (vph)	228	525	0	0	672	0	0	334	111	31	0	10	
Confl. Peds. (#/hr)	1		2	2		1	1					1	
Heavy Vehicles (%)	3%	2%	0%	0%	7%	8%	5%	10%	4%	11%	0%	3%	
Turn Type	custom	NA			NA		Split	NA	Prot	Prot		Prot	
Protected Phases	1	6			2		3	3	3	4		4	
Permitted Phases	2												
Actuated Green, G (s)	56.8	45.0			62.5			38.3	38.3	11.0		11.0	
Effective Green, g (s)	56.8	45.0			62.5			38.3	38.3	11.0		11.0	
Actuated g/C Ratio	0.37	0.29			0.41			0.25	0.25	0.07		0.07	
Clearance Time (s)	4.0	4.0						4.0	4.0	4.0		4.0	
Vehicle Extension (s)	2.5	3.0						2.5	2.5	3.5		3.5	
Lane Grp Cap (vph)	318	1040			1332			431	388	116		112	
v/s Ratio Prot	c0.09	0.15			c0.21			c0.19	0.07	c0.02		0.01	
v/s Ratio Perm	c0.18												
v/c Ratio	0.72	0.50			0.50			0.77	0.29	0.27		0.09	
Uniform Delay, d1	36.0	44.8			33.7			53.3	46.3	67.2		66.3	
Progression Factor	1.23	1.17			0.24			1.00	1.00	1.00		1.00	
Incremental Delay, d2	6.2	1.5			0.1			8.1	0.3	1.5		0.4	
Delay (s)	50.6	53.7			8.2			61.5	46.6	68.7		66.7	
Level of Service	D	D			A			E	D	E		E	
Approach Delay (s)		52.8			8.2			53.0				67.1	
Approach LOS		D			A			D				E	
Intersection Summary													
HCM 2000 Control Delay			41.1									HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio			0.66										
Actuated Cycle Length (s)			153.0									Sum of lost time (s)	22.5
Intersection Capacity Utilization			67.4%									ICU Level of Service	C
Analysis Period (min)			15										

c Critical Lane Group

Queues
8: E CC St & Lewis River Rd

Existing PM Peak Hour
07/03/2019















Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	999	118	466	217	76
v/c Ratio	0.45	0.74	0.55	0.83	0.21
Control Delay	6.0	93.2	55.8	87.4	1.3
Queue Delay	0.4	0.0	0.0	0.0	0.0
Total Delay	6.4	93.2	55.9	87.4	1.3
Queue Length 50th (ft)	382	116	224	210	0
Queue Length 95th (ft)	61	187	#328	303	0
Internal Link Dist (ft)	67		149		
Turn Bay Length (ft)		75		100	
Base Capacity (vph)	2361	191	848	311	407
Starvation Cap Reductn	748	0	0	0	0
Spillback Cap Reductn	0	0	10	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.62	0.62	0.56	0.70	0.19

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis
8: E CC St & Lewis River Rd

Existing PM Peak Hour
07/03/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↑	↑↑		↑		↑			
Traffic Volume (vph)	0	642	307	112	443	0	206	0	72	0	0	0
Future Volume (vph)	0	642	307	112	443	0	206	0	72	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	6.5		4.0		4.0			
Lane Util. Factor		0.95		1.00	0.95		1.00		1.00			
Frbp, ped/bikes		0.99		1.00	1.00		1.00		1.00			
Flpb, ped/bikes		1.00		1.00	1.00		1.00		1.00			
Frt		0.95		1.00	1.00		1.00		0.85			
Flt Protected		1.00		0.95	1.00		0.95		1.00			
Satd. Flow (prot)		3299		1719	3406		1641		1553			
Flt Permitted		1.00		0.95	1.00		0.95		1.00			
Satd. Flow (perm)		3299		1719	3406		1641		1553			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	676	323	118	466	0	217	0	76	0	0	0
RTOR Reduction (vph)	0	33	0	0	0	0	0	0	64	0	0	0
Lane Group Flow (vph)	0	966	0	118	466	0	217	0	12	0	0	0
Confl. Peds. (#/hr)			5	5								
Heavy Vehicles (%)	0%	3%	3%	5%	6%	0%	10%	0%	4%	0%	0%	0%
Turn Type		NA		Prot	NA		Prot		Prot			
Protected Phases		4 6 3		5	2		8		8			
Permitted Phases												
Actuated Green, G (s)		102.3		14.3	38.1		24.4		24.4			
Effective Green, g (s)		102.3		14.3	38.1		24.4		24.4			
Actuated g/C Ratio		0.67		0.09	0.25		0.16		0.16			
Clearance Time (s)				4.0	6.5		4.0		4.0			
Vehicle Extension (s)				2.5	3.8		1.5		1.5			
Lane Grp Cap (vph)		2205		160	848		261		247			
v/s Ratio Prot		c0.29		c0.07	c0.14		c0.13		0.01			
v/s Ratio Perm												
v/c Ratio		0.44		0.74	0.55		0.83		0.05			
Uniform Delay, d1		11.9		67.5	50.0		62.3		54.5			
Progression Factor		0.48		1.00	1.00		1.00		1.00			
Incremental Delay, d2		0.1		15.3	2.6		18.9		0.0			
Delay (s)		5.8		82.9	52.5		81.2		54.5			
Level of Service		A		F	D		F		D			
Approach Delay (s)		5.8			58.7			74.3			0.0	
Approach LOS		A			E			E			A	
Intersection Summary												
HCM 2000 Control Delay			32.9				HCM 2000 Level of Service				C	
HCM 2000 Volume to Capacity ratio			0.59									
Actuated Cycle Length (s)			153.0				Sum of lost time (s)		22.5			
Intersection Capacity Utilization			55.4%				ICU Level of Service				B	
Analysis Period (min)			15									

c Critical Lane Group

Intersection												
Int Delay, s/veh	1.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	8	0	27	12	1	22	34	671	9	25	516	12
Future Vol, veh/h	8	0	27	12	1	22	34	671	9	25	516	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	50	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	0	11	0	100	5	6	2	11	4	6	0
Mvmt Flow	9	0	29	13	1	24	37	722	10	27	555	13

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	1052	1422	562	1431	1423	366	568	0	0	732	0	0
Stage 1	616	616	-	801	801	-	-	-	-	-	-	-
Stage 2	436	806	-	630	622	-	-	-	-	-	-	-
Critical Hdwy	7.3	6.5	6.365	7.3	8	6.975	4.19	-	-	4.16	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.5	7	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.1	7	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.3	4.045	3.5	4.95	3.3475	2.257	-	-	2.238	-	-
Pot Cap-1 Maneuver	195	137	505	105	70	624	979	-	-	859	-	-
Stage 1	481	485	-	349	253	-	-	-	-	-	-	-
Stage 2	574	398	-	473	323	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	176	128	505	94	65	624	979	-	-	859	-	-
Mov Cap-2 Maneuver	176	128	-	94	65	-	-	-	-	-	-	-
Stage 1	463	470	-	336	243	-	-	-	-	-	-	-
Stage 2	529	383	-	432	313	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	16.4		27.7		0.4		0.4	
HCM LOS	C		D					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	979	-	-	354	196	859	-	-
HCM Lane V/C Ratio	0.037	-	-	0.106	0.192	0.031	-	-
HCM Control Delay (s)	8.8	-	-	16.4	27.7	9.3	-	-
HCM Lane LOS	A	-	-	C	D	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.4	0.7	0.1	-	-