

















# Appendix K

Build Alternative Analysis

# HCM Signalized Intersection Capacity Analysis

## 114: Florida Ave & Channelside Dr

01/19/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	847	1116	368	0	0	0	0	202	62	0	0	0
Future Volume (vph)	847	1116	368	0	0	0	0	202	62	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.1						6.0	6.0			
Lane Util. Factor	*0.51	*0.76						*0.80	1.00			
Frt	1.00	0.96						1.00	0.85			
Flt Protected	0.95	1.00						1.00	1.00			
Satd. Flow (prot)	1805	2726						2980	1583			
Flt Permitted	0.95	1.00						1.00	1.00			
Satd. Flow (perm)	1805	2726						2980	1583			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	921	1213	400	0	0	0	0	220	67	0	0	0
RTOR Reduction (vph)	245	15	0	0	0	0	0	0	60	0	0	0
Lane Group Flow (vph)	676	1598	0	0	0	0	0	220	7	0	0	0
Turn Type	Prot	NA						NA	Perm			
Protected Phases	1	6						4				
Permitted Phases									4			
Actuated Green, G (s)	58.0	112.9						15.0	15.0			
Effective Green, g (s)	58.0	112.9						15.0	15.0			
Actuated g/C Ratio	0.41	0.81						0.11	0.11			
Clearance Time (s)	6.0	6.1						6.0	6.0			
Vehicle Extension (s)	3.0	3.0						3.0	3.0			
Lane Grp Cap (vph)	747	2198						319	169			
v/s Ratio Prot	c0.37	c0.59						c0.07				
v/s Ratio Perm									0.00			
v/c Ratio	0.90	0.73						0.69	0.04			
Uniform Delay, d1	38.4	6.3						60.3	56.1			
Progression Factor	1.00	1.00						1.00	1.00			
Incremental Delay, d2	16.5	2.1						6.1	0.1			
Delay (s)	54.9	8.5						66.4	56.2			
Level of Service	D	A						E	E			
Approach Delay (s)		25.3			0.0			64.0			0.0	
Approach LOS		C			A			E			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			29.3					HCM 2000 Level of Service		C		
HCM 2000 Volume to Capacity ratio			0.82									
Actuated Cycle Length (s)			140.0					Sum of lost time (s)		18.6		
Intersection Capacity Utilization			85.8%					ICU Level of Service		E		
Analysis Period (min)			15									
c Critical Lane Group												

# Queues

## 114: Florida Ave & Channelside Dr

01/19/2022



Lane Group	EBL	EBT	NBT	NBR
Lane Group Flow (vph)	921	1613	220	67
v/c Ratio	0.93	0.73	0.69	0.28
Control Delay	36.9	8.3	72.3	13.1
Queue Delay	41.2	0.0	0.5	0.0
Total Delay	78.1	8.3	72.8	13.1
Queue Length 50th (ft)	496	356	122	0
Queue Length 95th (ft)	#805	446	178	40
Internal Link Dist (ft)		1290	1157	
Turn Bay Length (ft)				200
Base Capacity (vph)	993	2214	319	236
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	148	0	10	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.09	0.73	0.71	0.28

### Intersection Summary

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

HCM Signalized Intersection Capacity Analysis  
 115: Morgan St & Channelside Dr

01/19/2022

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	156	977	45	112	0	493	0	87	3	25	65	0	
Future Volume (vph)	156	977	45	112	0	493	0	87	3	25	65	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	5.5	6.2		5.9		5.9		5.9	5.9	5.9	5.9		
Lane Util. Factor	1.00	0.95		1.00		1.00		1.00	1.00	1.00	1.00		
Frt	1.00	0.99		1.00		0.85		1.00	0.85	1.00	1.00		
Flt Protected	0.95	1.00		0.95		1.00		1.00	1.00	0.95	1.00		
Satd. Flow (prot)	1770	3516		1770		1583		1863	1583	1770	1863		
Flt Permitted	0.95	1.00		0.26		1.00		1.00	1.00	0.68	1.00		
Satd. Flow (perm)	1770	3516		478		1583		1863	1583	1266	1863		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	170	1062	49	122	0	536	0	95	3	27	71	0	
RTOR Reduction (vph)	0	2	0	0	0	91	0	0	2	0	0	0	
Lane Group Flow (vph)	170	1109	0	122	0	445	0	95	1	27	71	0	
Turn Type	pm+pt	NA		Perm		Perm		NA	Perm	Perm	NA		
Protected Phases	1	6						4				8	
Permitted Phases	6			2		2			4	8			
Actuated Green, G (s)	103.8	103.8		89.3		89.3		24.1	24.1	24.1	24.1		
Effective Green, g (s)	103.8	103.8		89.3		89.3		24.1	24.1	24.1	24.1		
Actuated g/C Ratio	0.74	0.74		0.64		0.64		0.17	0.17	0.17	0.17		
Clearance Time (s)	5.5	6.2		5.9		5.9		5.9	5.9	5.9	5.9		
Vehicle Extension (s)	3.0	3.0		3.0		3.0		3.0	3.0	3.0	3.0		
Lane Grp Cap (vph)	1312	2606		304		1009		320	272	217	320		
v/s Ratio Prot	0.01	c0.32						c0.05			0.04		
v/s Ratio Perm	0.09			0.26		c0.28			0.00	0.02			
v/c Ratio	0.13	0.43		0.40		0.44		0.30	0.00	0.12	0.22		
Uniform Delay, d1	5.2	6.8		12.3		12.8		50.6	48.0	49.0	49.9		
Progression Factor	0.64	0.52		1.01		1.16		1.00	1.00	0.33	0.34		
Incremental Delay, d2	0.0	0.4		2.8		1.0		2.4	0.0	1.1	1.5		
Delay (s)	3.3	3.9		15.3		15.8		52.9	48.0	17.3	18.5		
Level of Service	A	A		B		B		D	D	B	B		
Approach Delay (s)		3.9			15.7			52.8			18.2		
Approach LOS		A			B			D			B		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			10.4									HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.42										
Actuated Cycle Length (s)			140.0									Sum of lost time (s)	17.3
Intersection Capacity Utilization			61.9%									ICU Level of Service	B
Analysis Period (min)			15										

c Critical Lane Group

Queues

115: Morgan St & Channelside Dr

01/19/2022



Lane Group	EBL	EBT	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	170	1111	122	536	95	3	27	71
v/c Ratio	0.13	0.43	0.40	0.49	0.30	0.01	0.12	0.22
Control Delay	3.4	3.9	16.6	8.8	53.5	0.0	17.5	18.7
Queue Delay	0.0	0.3	0.0	0.8	0.0	0.0	0.0	0.0
Total Delay	3.4	4.2	16.6	9.5	53.5	0.0	17.5	18.7
Queue Length 50th (ft)	19	67	38	78	76	0	12	35
Queue Length 95th (ft)	m29	85	m61	129	132	0	26	55
Internal Link Dist (ft)		523			1253			424
Turn Bay Length (ft)	450			10			100	
Base Capacity (vph)	1321	2607	305	1101	320	328	217	320
Starvation Cap Reductn	0	755	0	284	0	0	0	0
Spillback Cap Reductn	231	1	0	207	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.60	0.40	0.66	0.30	0.01	0.12	0.22

Intersection Summary

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

HCM 6th Signalized Intersection Summary  
 116: Channelside Dr & Jefferson St

01/19/2022

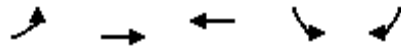


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↑	↗		↙	↘
Traffic Volume (veh/h)	346	660	509	151	6	96
Future Volume (veh/h)	346	660	509	151	6	96
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	376	717	553	164	7	104
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	613	1443	713	211	261	232
Arrive On Green	0.07	0.25	0.68	0.68	0.15	0.15
Sat Flow, veh/h	1781	1870	1386	411	1781	1585
Grp Volume(v), veh/h	376	717	0	717	7	104
Grp Sat Flow(s),veh/h/ln	1781	1870	0	1796	1781	1585
Q Serve(g_s), s	9.9	45.8	0.0	37.6	0.5	8.4
Cycle Q Clear(g_c), s	9.9	45.8	0.0	37.6	0.5	8.4
Prop In Lane	1.00			0.23	1.00	1.00
Lane Grp Cap(c), veh/h	613	1443	0	924	261	232
V/C Ratio(X)	0.61	0.50	0.00	0.78	0.03	0.45
Avail Cap(c_a), veh/h	613	1443	0	924	261	232
HCM Platoon Ratio	0.33	0.33	1.33	1.33	1.00	1.00
Upstream Filter(I)	0.91	0.91	0.00	0.82	0.09	0.09
Uniform Delay (d), s/veh	22.2	29.0	0.0	16.7	51.2	54.6
Incr Delay (d2), s/veh	4.1	1.1	0.0	5.3	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.6	23.5	0.0	14.2	0.2	3.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	26.4	30.1	0.0	22.0	51.2	55.1
LnGrp LOS	C	C	A	C	D	E
Approach Vol, veh/h		1093	717		111	
Approach Delay, s/veh		28.8	22.0		54.9	
Approach LOS		C	C		D	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	36.0	78.0			114.0	26.0
Change Period (Y+Rc), s	6.0	6.0			6.0	5.5
Max Green Setting (Gmax), s	30.0	72.0			108.0	20.5
Max Q Clear Time (g_c+I1), s	11.9	39.6			47.8	10.4
Green Ext Time (p_c), s	1.1	6.1			6.2	0.2
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			27.8			
HCM 6th LOS			C			

Queues

116: Channelside Dr & Jefferson St

01/19/2022



Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	376	717	717	7	104
v/c Ratio	0.68	0.50	0.77	0.03	0.33
Control Delay	20.1	2.6	30.5	45.5	29.5
Queue Delay	0.8	0.1	6.6	0.0	0.0
Total Delay	21.0	2.7	37.1	45.5	29.5
Queue Length 50th (ft)	47	20	538	0	67
Queue Length 95th (ft)	219	22	665	m6	m57
Internal Link Dist (ft)		315	131	443	
Turn Bay Length (ft)				100	
Base Capacity (vph)	551	1437	936	259	320
Starvation Cap Reductn	42	80	173	0	0
Spillback Cap Reductn	0	85	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.74	0.53	0.94	0.03	0.33

Intersection Summary

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

HCM 6th Signalized Intersection Summary  
 117: Channelside Dr & Nebraska Ave

01/19/2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	121	545	454	195	30	206
Future Volume (veh/h)	121	545	454	195	30	206
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	132	592	493	212	33	224
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	635	1483	886	381	26	175
Arrive On Green	0.07	1.00	1.00	1.00	0.13	0.13
Sat Flow, veh/h	1781	1870	1241	534	206	1397
Grp Volume(v), veh/h	132	592	0	705	258	0
Grp Sat Flow(s),veh/h/ln	1781	1870	0	1774	1609	0
Q Serve(g_s), s	0.0	0.0	0.0	0.0	17.5	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	17.5	0.0
Prop In Lane	1.00			0.30	0.13	0.87
Lane Grp Cap(c), veh/h	635	1483	0	1267	201	0
V/C Ratio(X)	0.21	0.40	0.00	0.56	1.28	0.00
Avail Cap(c_a), veh/h	635	1483	0	1267	201	0
HCM Platoon Ratio	2.00	2.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.86	0.86	0.00	0.69	0.90	0.00
Uniform Delay (d), s/veh	5.7	0.0	0.0	0.0	61.3	0.0
Incr Delay (d2), s/veh	0.6	0.7	0.0	1.2	157.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.3	0.0	0.4	16.0	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	6.3	0.7	0.0	1.2	218.2	0.0
LnGrp LOS	A	A	A	A	F	A
Approach Vol, veh/h		724	705		258	
Approach Delay, s/veh		1.7	1.2		218.2	
Approach LOS		A	A		F	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	11.0	106.0			117.0	23.0
Change Period (Y+Rc), s	6.0	6.0			6.0	5.5
Max Green Setting (Gmax), s	5.0	100.0			111.0	17.5
Max Q Clear Time (g_c+I1), s	2.0	2.0			2.0	19.5
Green Ext Time (p_c), s	0.1	5.7			4.2	0.0
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			34.6			
HCM 6th LOS			C			



# Queues

## 117: Channelside Dr & Nebraska Ave

01/19/2022



Lane Group	EBL	EBT	WBT	SBL
Lane Group Flow (vph)	132	592	705	257
v/c Ratio	0.25	0.40	0.55	0.68
Control Delay	2.6	3.1	4.3	26.0
Queue Delay	0.9	0.3	1.4	65.1
Total Delay	3.5	3.4	5.7	91.1
Queue Length 50th (ft)	7	150	60	72
Queue Length 95th (ft)	10	131	78	129
Internal Link Dist (ft)		131	222	457
Turn Bay Length (ft)	80			
Base Capacity (vph)	519	1477	1286	378
Starvation Cap Reductn	206	361	197	0
Spillback Cap Reductn	0	0	371	208
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.42	0.53	0.77	1.51

### Intersection Summary

HCM 6th Signalized Intersection Summary  
 119: Old Water St & Channelside Dr

01/19/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗		↖	↗	
Traffic Volume (veh/h)	91	461	23	93	625	154	7	33	20	38	5	17
Future Volume (veh/h)	91	461	23	93	625	154	7	33	20	38	5	17
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	99	501	25	101	679	167	8	36	22	41	5	18
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	513	1218	61	848	1175	289	236	158	96	207	52	186
Arrive On Green	0.07	1.00	1.00	0.31	1.00	1.00	0.14	0.14	0.14	0.14	0.14	0.14
Sat Flow, veh/h	1781	1766	88	1781	1450	357	1388	1087	664	1345	356	1283
Grp Volume(v), veh/h	99	0	526	101	0	846	8	0	58	41	0	23
Grp Sat Flow(s),veh/h/ln	1781	0	1854	1781	0	1806	1388	0	1751	1345	0	1639
Q Serve(g_s), s	2.9	0.0	0.0	0.0	0.0	0.0	0.7	0.0	4.1	3.9	0.0	1.7
Cycle Q Clear(g_c), s	2.9	0.0	0.0	0.0	0.0	0.0	2.4	0.0	4.1	8.0	0.0	1.7
Prop In Lane	1.00		0.05	1.00		0.20	1.00		0.38	1.00		0.78
Lane Grp Cap(c), veh/h	513	0	1278	848	0	1464	236	0	254	207	0	238
V/C Ratio(X)	0.19	0.00	0.41	0.12	0.00	0.58	0.03	0.00	0.23	0.20	0.00	0.10
Avail Cap(c_a), veh/h	513	0	1278	848	0	1464	236	0	254	207	0	238
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.87	0.00	0.87	0.49	0.00	0.49	1.00	0.00	1.00	0.82	0.00	0.82
Uniform Delay (d), s/veh	8.2	0.0	0.0	4.0	0.0	0.0	52.9	0.0	52.9	56.5	0.0	51.9
Incr Delay (d2), s/veh	0.7	0.0	0.9	0.1	0.0	0.8	0.3	0.0	2.1	1.8	0.0	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	0.3	0.7	0.0	0.3	0.3	0.0	2.0	1.4	0.0	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.0	0.0	0.9	4.1	0.0	0.8	53.2	0.0	55.0	58.2	0.0	52.6
LnGrp LOS	A	A	A	A	A	A	D	A	E	E	A	D
Approach Vol, veh/h		625			947			66				64
Approach Delay, s/veh		2.1			1.2			54.8				56.2
Approach LOS		A			A			D				E
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.0	120.5		26.0	28.5	103.0		26.0				
Change Period (Y+Rc), s	6.0	6.5		* 5.7	6.5	* 6.5		* 5.7				
Max Green Setting (Gmax), s	5.0	96.5		* 20	5.0	* 97		* 20				
Max Q Clear Time (g_c+I1), s	4.9	2.0		6.1	2.0	2.0		10.0				
Green Ext Time (p_c), s	0.0	8.7		0.3	0.1	4.0		0.2				

Intersection Summary

HCM 6th Ctrl Delay	5.7
HCM 6th LOS	A

Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Queues

119: Old Water St & Channelside Dr

01/19/2022



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	99	526	101	846	8	58	41	23
v/c Ratio	0.32	0.41	0.16	0.68	0.04	0.21	0.21	0.09
Control Delay	5.5	4.1	11.1	19.8	52.3	40.3	60.9	29.2
Queue Delay	0.0	0.4	0.0	7.8	0.0	0.0	0.0	0.0
Total Delay	5.5	4.5	11.1	27.6	52.3	40.3	60.9	29.2
Queue Length 50th (ft)	8	48	41	465	6	32	0	5
Queue Length 95th (ft)	m13	55	m47	m491	23	77	m0	m27
Internal Link Dist (ft)		222		393		1129		462
Turn Bay Length (ft)	80		100				150	
Base Capacity (vph)	311	1276	633	1251	200	270	194	253
Starvation Cap Reductn	0	327	0	363	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.55	0.16	0.95	0.04	0.21	0.21	0.09

Intersection Summary

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

# HCM Signalized Intersection Capacity Analysis

## 118: Beneficial Dr/Meridian Ave & Channelside Dr

01/19/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	238	270	11	94	419	61	88	448	64	62	303	365
Future Volume (vph)	238	270	11	94	419	61	88	448	64	62	303	365
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.2		6.2	6.2		6.4	6.4	6.4	6.4	6.4	6.4
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1852		1770	1827		1770	1863	1583	1770	1863	1583
Flt Permitted	0.09	1.00		0.57	1.00		0.22	1.00	1.00	0.23	1.00	1.00
Satd. Flow (perm)	166	1852		1070	1827		402	1863	1583	434	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	259	293	12	102	455	66	96	487	70	67	329	397
RTOR Reduction (vph)	0	1	0	0	4	0	0	0	48	0	0	305
Lane Group Flow (vph)	259	304	0	102	517	0	96	487	22	67	329	92
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	1	6			2		7	4			8	
Permitted Phases	6			2			4		4	8		8
Actuated Green, G (s)	82.8	82.8		38.8	38.8		44.6	44.6	44.6	32.6	32.6	32.6
Effective Green, g (s)	82.8	82.8		38.8	38.8		44.6	44.6	44.6	32.6	32.6	32.6
Actuated g/C Ratio	0.59	0.59		0.28	0.28		0.32	0.32	0.32	0.23	0.23	0.23
Clearance Time (s)	6.0	6.2		6.2	6.2		6.4	6.4	6.4	6.4	6.4	6.4
Vehicle Extension (s)	2.0	3.0		3.0	3.0		2.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	533	1095		296	506		182	593	504	101	433	368
v/s Ratio Prot	c0.13	0.16			c0.28		0.02	c0.26			0.18	
v/s Ratio Perm	0.16			0.10			0.15		0.01	0.15		0.06
v/c Ratio	0.49	0.28		0.34	1.02		0.53	0.82	0.04	0.66	0.76	0.25
Uniform Delay, d1	28.3	14.0		40.4	50.6		36.6	44.0	33.0	48.7	50.1	43.8
Progression Factor	0.52	0.42		1.00	1.00		1.00	1.00	1.00	0.31	0.31	2.19
Incremental Delay, d2	3.0	0.6		3.2	45.8		1.3	12.1	0.2	27.8	11.1	1.5
Delay (s)	17.6	6.5		43.6	96.4		37.9	56.1	33.1	43.0	26.9	97.5
Level of Service	B	A		D	F		D	E	C	D	C	F
Approach Delay (s)		11.6			87.8			51.0			63.6	
Approach LOS		B			F			D			E	

### Intersection Summary

HCM 2000 Control Delay	55.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	91.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Queues

118: Beneficial Dr/Meridian Ave & Channelside Dr

01/19/2022



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	259	305	102	521	96	487	70	67	329	397
v/c Ratio	0.49	0.28	0.34	1.02	0.53	0.82	0.13	0.66	0.76	0.59
Control Delay	15.9	6.5	44.5	94.8	46.5	56.8	7.3	46.1	27.4	12.7
Queue Delay	0.4	0.4	0.0	0.6	3.9	0.0	0.0	0.0	0.0	4.4
Total Delay	16.3	6.9	44.5	95.4	50.4	56.8	7.3	46.1	27.4	17.1
Queue Length 50th (ft)	75	66	75	~500	63	409	0	41	221	178
Queue Length 95th (ft)	121	90	131	#728	109	#581	35	m#131	356	373
Internal Link Dist (ft)		393		142		1114			460	
Turn Bay Length (ft)	150		150		300			200		
Base Capacity (vph)	533	1096	296	509	182	593	553	101	433	673
Starvation Cap Reductn	58	401	0	0	0	0	0	0	0	148
Spillback Cap Reductn	0	0	0	1	38	0	0	0	0	200
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.44	0.34	1.03	0.67	0.82	0.13	0.66	0.76	0.84

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

# HCS7 Two-Way Stop-Control Report

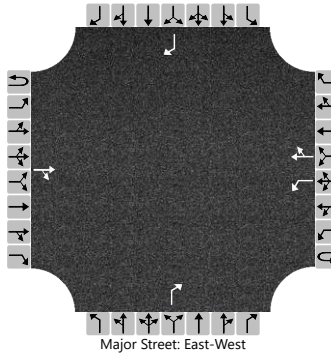
## General Information

Analyst	H.W. Lochner
Agency/Co.	
Date Performed	09/24/2021
Analysis Year	2026
Time Analyzed	AM Peak Hour
Intersection Orientation	East-West
Project Description	Whiting PD&E Study

## Site Information

Intersection	ChannelsideDr&12thSt
Jurisdiction	FDOT, District 7
East/West Street	Channelside Dr
North/South Street	12th St
Peak Hour Factor	0.95
Analysis Time Period (hrs)	1.00

## Lanes



## Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	1	0	0	1	1	0		0	0	1		0	0	1
Configuration				TR		L		TR				R				R
Volume (veh/h)			293	103		8	343	1				60				231
Percent Heavy Vehicles (%)						2						2				2
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized										No				No		
Median Type   Storage	Undivided															

## Critical and Follow-up Headways

Base Critical Headway (sec)					4.1							6.2				6.2
Critical Headway (sec)					4.12							6.22				6.22
Base Follow-Up Headway (sec)					2.2							3.3				3.3
Follow-Up Headway (sec)					2.22							3.32				3.32

## Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)					8							63				243		
Capacity, c (veh/h)					1142							682				683		
v/c Ratio					0.01							0.09				0.36		
95% Queue Length, Q <sub>95</sub> (veh)					0.0							0.3				1.6		
Control Delay (s/veh)					8.2							10.8				13.2		
Level of Service (LOS)					A							B				B		
Approach Delay (s/veh)					0.2						10.8				13.2			
Approach LOS					A						B				B			

# MOVEMENT SUMMARY

**Site: 8 [Channelside Drive at Cumberland Avenue\_Build2026-AM (Site Folder: General)]**

Build 2026 Year -  
 AM Peak Hour  
 Site Category: (None)  
 Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
		[ Total veh/h ]	[ HV % ]	[ Total veh/h ]	[ HV % ]				[ Veh. veh ]	[ Dist ft ]				
South: Channelside Drive														
3	L2	94	2.0	99	2.0	0.346	6.1	LOS A	1.8	44.5	0.29	0.16	0.29	37.1
8	T1	300	2.0	316	2.0	0.346	6.1	LOS A	1.8	44.5	0.29	0.16	0.29	37.9
18	R2	22	2.0	23	2.0	0.346	6.1	LOS A	1.8	44.5	0.29	0.16	0.29	36.7
Approach		416	2.0	438	2.0	0.346	6.1	LOS A	1.8	44.5	0.29	0.16	0.29	37.7
East: E Cumberland Avenue														
1	L2	4	2.0	4	2.0	0.029	4.1	LOS A	0.1	2.6	0.43	0.31	0.43	39.8
6	T1	5	2.0	5	2.0	0.029	4.1	LOS A	0.1	2.6	0.43	0.31	0.43	36.9
16	R2	17	2.0	18	2.0	0.029	4.1	LOS A	0.1	2.6	0.43	0.31	0.43	36.7
Approach		26	2.0	27	2.0	0.029	4.1	LOS A	0.1	2.6	0.43	0.31	0.43	37.2
North: Channelside Drive														
7	L2	45	2.0	47	2.0	0.322	5.8	LOS A	1.6	40.2	0.28	0.15	0.28	37.5
4	T1	343	2.0	361	2.0	0.322	5.8	LOS A	1.6	40.2	0.28	0.15	0.28	39.2
14	R2	258	2.0	272	2.0	0.227	5.0	LOS A	1.0	26.0	0.26	0.14	0.26	34.4
Approach		646	2.0	680	2.0	0.322	5.5	LOS A	1.6	40.2	0.27	0.15	0.27	37.0
West: E Cumberland Avenue														
5	L2	39	2.0	41	2.0	0.076	4.4	LOS A	0.3	6.9	0.43	0.33	0.43	34.6
2	T1	22	2.0	23	2.0	0.076	4.4	LOS A	0.3	6.9	0.43	0.33	0.43	34.4
12	R2	9	2.0	9	2.0	0.076	4.4	LOS A	0.3	6.9	0.43	0.33	0.43	33.3
Approach		70	2.0	74	2.0	0.076	4.4	LOS A	0.3	6.9	0.43	0.33	0.43	34.3
All Vehicles		1158	2.0	1219	2.0	0.346	5.6	LOS A	1.8	44.5	0.29	0.17	0.29	37.1

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# HCS7 Two-Way Stop-Control Report

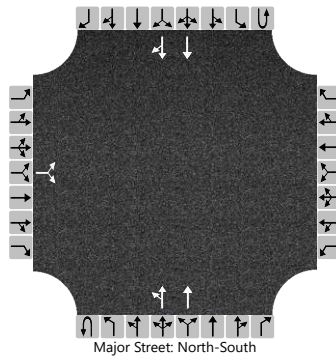
## General Information

Analyst	H.W. Lochner
Agency/Co.	
Date Performed	09/24/2021
Analysis Year	2026
Time Analyzed	AM Peak Hour
Intersection Orientation	North-South
Project Description	Whiting PD&E Study

## Site Information

Intersection	ChannelsideDr&E WhitingSt
Jurisdiction	FDOT, District 7
East/West Street	E Whiting St
North/South Street	Channelside Dr
Peak Hour Factor	0.95
Analysis Time Period (hrs)	1.00

## Lanes



## Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound				
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Movement																	
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6	
Number of Lanes		0	1	0		0	0	0		0	2	0		0	2	0	
Configuration			LR							LT	T				T	TR	
Volume (veh/h)		29		1						12	344				646	100	
Percent Heavy Vehicles (%)		2		2						2							
Proportion Time Blocked																	
Percent Grade (%)		0															
Right Turn Channelized																	
Median Type   Storage		Undivided															

## Critical and Follow-up Headways

Base Critical Headway (sec)		7.5		6.9						4.1						
Critical Headway (sec)		6.84		6.94						4.14						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.52		3.32						2.22						

## Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			32								13							
Capacity, c (veh/h)			263								829							
v/c Ratio			0.12								0.02							
95% Queue Length, Q <sub>95</sub> (veh)			0.4								0.0							
Control Delay (s/veh)			20.6								9.4							
Level of Service (LOS)			C								A							
Approach Delay (s/veh)		20.6									0.4							
Approach LOS		C									A							



HCM Signalized Intersection Capacity Analysis  
 130: Channelside Dr & E Washington St/E York St

01/19/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↗	↖	↕		↖	↕	
Traffic Volume (vph)	14	7	5	8	5	35	5	364	7	85	730	26
Future Volume (vph)	14	7	5	8	5	35	5	364	7	85	730	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.9			8.4	8.4	6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frt		0.98			1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.97			0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1770			1805	1583	1770	3529		1770	3521	
Flt Permitted		0.34			0.79	1.00	0.34	1.00		0.95	1.00	
Satd. Flow (perm)		620			1469	1583	637	3529		1770	3521	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	15	8	5	9	5	38	5	396	8	92	793	28
RTOR Reduction (vph)	0	5	0	0	0	36	0	1	0	0	1	0
Lane Group Flow (vph)	0	23	0	0	14	2	5	403	0	92	820	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Prot	NA	
Protected Phases		4			3			2		1	1	2
Permitted Phases	4			3		3	2					
Actuated Green, G (s)		9.0			7.9	7.9	79.4	79.4		17.4	102.8	
Effective Green, g (s)		9.0			7.9	7.9	79.4	79.4		17.4	102.8	
Actuated g/C Ratio		0.06			0.06	0.06	0.57	0.57		0.12	0.73	
Clearance Time (s)		5.9			8.4	8.4	6.0	6.0		6.0		
Vehicle Extension (s)		2.0			4.0	4.0	3.0	3.0		2.0		
Lane Grp Cap (vph)		39			82	89	361	2001		219	2585	
v/s Ratio Prot								0.11		c0.05	c0.23	
v/s Ratio Perm		c0.04			c0.01	0.00	0.01					
v/c Ratio		0.60			0.17	0.02	0.01	0.20		0.42	0.32	
Uniform Delay, d1		63.7			62.9	62.4	13.2	14.8		56.6	6.4	
Progression Factor		0.80			1.00	1.00	1.00	1.00		0.79	2.35	
Incremental Delay, d2		15.2			1.4	0.1	0.1	0.2		0.4	0.0	
Delay (s)		66.3			64.3	62.6	13.3	15.0		45.3	15.2	
Level of Service		E			E	E	B	B		D	B	
Approach Delay (s)		66.3			63.0			15.0			18.2	
Approach LOS		E			E			B			B	

Intersection Summary

HCM 2000 Control Delay	19.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.3
Intersection Capacity Utilization	52.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Queues

130: Channelside Dr & E Washington St/E York St

01/19/2022


























Lane Group	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	28	14	38	5	404	92	821
v/c Ratio	0.52	0.17	0.19	0.01	0.20	0.42	0.31
Control Delay	71.8	67.0	2.1	20.8	17.0	48.3	16.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.8	67.0	2.1	20.8	17.0	48.3	16.7
Queue Length 50th (ft)	22	12	0	2	94	88	197
Queue Length 95th (ft)	56	36	0	12	162	m133	291
Internal Link Dist (ft)	927	832			494		591
Turn Bay Length (ft)			430	160		280	
Base Capacity (vph)	106	226	342	372	2063	219	2648
Starvation Cap Reductn	0	0	0	0	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	0.26	0.06	0.11	0.01	0.20	0.42	0.31

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis  
129: Channelside Dr & Kennedy Blvd

01/19/2022

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	411	29	130	7	11	4	35	367	11	28	710	958	
Future Volume (vph)	411	29	130	7	11	4	35	367	11	28	710	958	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	6.3	6.3	6.3		6.8	6.8	6.3	6.3		6.3	6.3	6.3	
Lane Util. Factor	0.95	0.95	1.00		1.00	1.00	1.00	0.95		1.00	0.95	1.00	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	1.00		1.00	1.00	0.85	
Flt Protected	0.95	0.96	1.00		0.98	1.00	0.95	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	1681	1696	1583		1826	1583	1770	3524		1770	3539	1583	
Flt Permitted	0.95	0.96	1.00		0.76	1.00	0.18	1.00		0.43	1.00	1.00	
Satd. Flow (perm)	1681	1696	1583		1413	1583	327	3524		798	3539	1583	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	447	32	141	8	12	4	38	399	12	30	772	1041	
RTOR Reduction (vph)	0	0	114	0	0	4	0	1	0	0	0	721	
Lane Group Flow (vph)	237	242	27	0	20	0	38	410	0	30	772	320	
Turn Type	Split	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm	
Protected Phases	3	3			1			2			2		
Permitted Phases			3	1		1	2			2		2	
Actuated Green, G (s)	27.1	27.1	27.1		5.1	5.1	43.0	43.0		43.0	43.0	43.0	
Effective Green, g (s)	27.1	27.1	27.1		5.1	5.1	43.0	43.0		43.0	43.0	43.0	
Actuated g/C Ratio	0.19	0.19	0.19		0.04	0.04	0.31	0.31		0.31	0.31	0.31	
Clearance Time (s)	6.3	6.3	6.3		6.8	6.8	6.3	6.3		6.3	6.3	6.3	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	325	328	306		51	57	100	1082		245	1086	486	
v/s Ratio Prot	0.14	c0.14						0.12			c0.22		
v/s Ratio Perm			0.02		c0.01	0.00	0.12			0.04		0.20	
v/c Ratio	0.73	0.74	0.09		0.39	0.00	0.38	0.38		0.12	0.71	0.66	
Uniform Delay, d1	53.0	53.1	46.3		65.9	65.0	38.0	38.0		34.9	43.0	42.1	
Progression Factor	1.00	1.00	1.00		1.00	1.00	0.57	0.63		1.00	1.00	1.00	
Incremental Delay, d2	8.0	8.4	0.1		4.9	0.0	10.5	1.0		1.0	4.0	6.8	
Delay (s)	61.0	61.5	46.4		70.9	65.0	32.4	24.9		35.9	46.9	48.9	
Level of Service	E	E	D		E	E	C	C		D	D	D	
Approach Delay (s)		57.9			69.9			25.5			47.9		
Approach LOS		E			E			C			D		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			46.8		HCM 2000 Level of Service						D		
HCM 2000 Volume to Capacity ratio			0.45										
Actuated Cycle Length (s)			140.0		Sum of lost time (s)						22.4		
Intersection Capacity Utilization			92.2%		ICU Level of Service						F		
Analysis Period (min)			15										

c Critical Lane Group

Queues

129: Channelside Dr & Kennedy Blvd

01/19/2022



Lane Group	EBL	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	237	242	141	20	4	38	411	30	772	1041
v/c Ratio	0.73	0.74	0.34	0.27	0.02	0.36	0.36	0.12	0.67	0.86
Control Delay	65.2	65.7	8.4	71.7	0.2	31.1	23.4	34.7	44.1	10.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.2	65.7	8.4	71.7	0.2	31.1	23.4	34.7	44.1	10.4
Queue Length 50th (ft)	216	221	0	18	0	26	151	19	318	0
Queue Length 95th (ft)	288	294	53	46	0	66	198	46	392	164
Internal Link Dist (ft)		906		876			591		1242	
Turn Bay Length (ft)			140			280		75		375
Base Capacity (vph)	656	662	704	153	259	107	1152	260	1155	1217
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.37	0.20	0.13	0.02	0.36	0.36	0.12	0.67	0.86

Intersection Summary

# HCM Signalized Intersection Capacity Analysis

## 113: Florida Ave & Selmon Expy Off-Ramp

01/19/2022



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↑↑↑	↑↑			
Traffic Volume (vph)	0	933	1067	0	0	0
Future Volume (vph)	0	933	1067	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.6	6.0			
Lane Util. Factor		0.76	0.95			
Frt		0.85	1.00			
Flt Protected		1.00	1.00			
Satd. Flow (prot)		3610	3539			
Flt Permitted		1.00	1.00			
Satd. Flow (perm)		3610	3539			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1014	1160	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	1014	1160	0	0	0
Turn Type		Prot	NA			
Protected Phases		2	1 4			
Permitted Phases						
Actuated Green, G (s)		48.4	79.0			
Effective Green, g (s)		48.4	79.0			
Actuated g/C Ratio		0.35	0.56			
Clearance Time (s)		6.6				
Vehicle Extension (s)		3.0				
Lane Grp Cap (vph)		1248	1997			
v/s Ratio Prot		c0.28	c0.33			
v/s Ratio Perm						
v/c Ratio		0.81	0.58			
Uniform Delay, d1		41.7	19.8			
Progression Factor		1.00	0.39			
Incremental Delay, d2		5.8	0.2			
Delay (s)		47.5	8.0			
Level of Service		D	A			
Approach Delay (s)	47.5		8.0		0.0	
Approach LOS	D		A		A	

### Intersection Summary

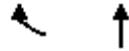
HCM 2000 Control Delay	26.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	88.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

# Queues

## 113: Florida Ave & Selmon Expy Off-Ramp

01/19/2022



Lane Group	WBR	NBT
Lane Group Flow (vph)	1014	1160
v/c Ratio	0.81	0.58
Control Delay	47.9	8.4
Queue Delay	0.0	0.0
Total Delay	47.9	8.4
Queue Length 50th (ft)	367	227
Queue Length 95th (ft)	441	m148
Internal Link Dist (ft)		1
Turn Bay Length (ft)	350	
Base Capacity (vph)	1248	1997
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.81	0.58
















### Intersection Summary

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

# HCM Signalized Intersection Capacity Analysis

109: Florida Ave & Brorein St

01/19/2022

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	0	0	0	0	1876	290	216	1820	0	0	0	0	
Future Volume (vph)	0	0	0	0	1876	290	216	1820	0	0	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)					5.8		6.1	6.1					
Lane Util. Factor					0.86		1.00	0.91					
Frt					0.98		1.00	1.00					
Flt Protected					1.00		0.95	1.00					
Satd. Flow (prot)					6279		1770	5085					
Flt Permitted					1.00		0.95	1.00					
Satd. Flow (perm)					6279		1770	5085					
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	0	0	0	0	2039	315	235	1978	0	0	0	0	
RTOR Reduction (vph)	0	0	0	0	19	0	22	0	0	0	0	0	
Lane Group Flow (vph)	0	0	0	0	2335	0	213	1978	0	0	0	0	
Turn Type					NA		Perm	NA					
Protected Phases					2			4					
Permitted Phases							4						
Actuated Green, G (s)					54.2		73.9	73.9					
Effective Green, g (s)					54.2		73.9	73.9					
Actuated g/C Ratio					0.37		0.51	0.51					
Clearance Time (s)					5.8		6.1	6.1					
Vehicle Extension (s)					3.0		3.0	3.0					
Lane Grp Cap (vph)					2347		902	2591					
v/s Ratio Prot					c0.37			c0.39					
v/s Ratio Perm							0.12						
v/c Ratio					0.99		0.24	0.76					
Uniform Delay, d1					45.3		19.8	28.5					
Progression Factor					1.00		1.00	1.00					
Incremental Delay, d2					17.4		0.6	2.2					
Delay (s)					62.6		20.4	30.7					
Level of Service					E		C	C					
Approach Delay (s)		0.0			62.6			29.6			0.0		
Approach LOS		A			E			C			A		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			46.6		HCM 2000 Level of Service				D				
HCM 2000 Volume to Capacity ratio			0.85										
Actuated Cycle Length (s)			145.0		Sum of lost time (s)				14.9				
Intersection Capacity Utilization			77.1%		ICU Level of Service				D				
Analysis Period (min)			15										
c Critical Lane Group													

# Queues

## 109: Florida Ave & Brorein St

01/19/2022



Lane Group	WBT	NBL	NBT
Lane Group Flow (vph)	2354	235	1978
v/c Ratio	0.99	0.25	0.76
Control Delay	61.7	16.9	31.0
Queue Delay	0.0	1.1	47.6
Total Delay	61.7	17.9	78.6
Queue Length 50th (ft)	635	98	536
Queue Length 95th (ft)	#731	154	596
Internal Link Dist (ft)	416		356
Turn Bay Length (ft)		300	
Base Capacity (vph)	2366	923	2591
Starvation Cap Reductn	0	470	919
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.99	0.52	1.18

### Intersection Summary

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



# HCM Signalized Intersection Capacity Analysis

## 110: Morgan St & Brorein St & Selmon Expy Off-Ramp

01/19/2022



Movement	WBL	WBT	NBL	NBT	NBR2	SBL	SBT	SBR	SWR	SWR2
Lane Configurations		↔↑	↔	↑	↔	↔	↔		↔	↔
Traffic Volume (vph)	1	1752	56	607	56	513	100	191	695	541
Future Volume (vph)	1	1752	56	607	56	513	100	191	695	541
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.7	5.5	6.0	6.0	5.5	6.0		5.7	5.7
Lane Util. Factor		0.95	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt		1.00	1.00	1.00	0.85	1.00	0.90		1.00	0.85
Flt Protected		1.00	0.95	1.00	1.00	0.95	1.00		1.00	1.00
Satd. Flow (prot)		3539	1770	1863	1583	1770	1679		1863	1583
Flt Permitted		1.00	0.44	1.00	1.00	0.23	1.00		1.00	1.00
Satd. Flow (perm)		3539	819	1863	1583	427	1679		1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	1904	61	660	61	558	109	208	755	588
RTOR Reduction (vph)	0	0	0	0	31	0	49	0	0	185
Lane Group Flow (vph)	0	1905	61	660	31	558	268	0	755	403
Turn Type	Perm	NA	pm+pt	NA	Perm	pm+pt	NA		Prot	Perm
Protected Phases		2!	7	4		3	8		2!	
Permitted Phases	2		4		4	8				2
Actuated Green, G (s)		46.3	82.0	70.0	70.0	70.5	64.0		46.3	46.3
Effective Green, g (s)		46.3	82.0	70.0	70.0	70.5	64.0		46.3	46.3
Actuated g/C Ratio		0.33	0.59	0.50	0.50	0.50	0.46		0.33	0.33
Clearance Time (s)		5.7	5.5	6.0	6.0	5.5	6.0		5.7	5.7
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		1170	564	931	791	277	767		616	523
v/s Ratio Prot			0.01	c0.35		c0.09	0.16		0.41	
v/s Ratio Perm		0.54	0.05		0.02	c0.92				0.25
v/c Ratio		1.63	0.11	0.71	0.04	2.01	0.35		1.23	0.77
Uniform Delay, d1		46.9	13.4	27.1	17.8	37.5	24.6		46.9	42.1
Progression Factor		0.66	0.81	0.89	0.81	1.53	1.41		1.00	1.00
Incremental Delay, d2		283.1	0.4	4.3	0.1	465.3	0.9		115.5	10.5
Delay (s)		314.0	11.2	28.3	14.6	522.7	35.5		162.3	52.6
Level of Service		F	B	C	B	F	D		F	D
Approach Delay (s)		314.0		25.9			346.2			
Approach LOS		F		C			F			

### Intersection Summary

HCM 2000 Control Delay	219.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.79		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	17.2
Intersection Capacity Utilization	170.9%	ICU Level of Service	H
Analysis Period (min)	15		

! Phase conflict between lane groups.

c Critical Lane Group

Queues

110: Morgan St & Brorein St & Selmon Expy Off-Ramp

01/19/2022



Lane Group	WBT	NBL	NBT	NBR2	SBL	SBT	SWR	SWR2
Lane Group Flow (vph)	1905	61	660	61	558	317	755	588
v/c Ratio	1.63	0.11	0.71	0.07	2.01	0.39	1.23	0.83
Control Delay	309.0	10.4	28.9	3.3	486.1	25.8	155.6	33.7
Queue Delay	0.7	0.0	24.2	0.0	0.0	0.0	0.0	0.0
Total Delay	309.7	10.4	53.1	3.3	486.1	25.8	155.6	33.7
Queue Length 50th (ft)	~1351	13	513	2	~791	210	~845	284
Queue Length 95th (ft)	m#1042	36	726	18	m#1008	m278	#1092	#465
Internal Link Dist (ft)	494		424			563		
Turn Bay Length (ft)		250		10			300	300
Base Capacity (vph)	1170	567	931	823	278	816	616	708
Starvation Cap Reductn	175	0	286	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.91	0.11	1.02	0.07	2.01	0.39	1.23	0.83

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

# HCM 6th Signalized Intersection Summary

111: Jefferson St & Brorein St

01/19/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↕		↖	↕		↖	↗	↖
Traffic Volume (veh/h)	97	161	24	31	1632	290	35	224	1	310	497	86
Future Volume (veh/h)	97	161	24	31	1632	290	35	224	1	310	497	86
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	105	175	26	34	1774	315	38	243	1	337	540	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	172	958	142	636	1500	259	121	682	3	358	445	
Arrive On Green	0.07	0.60	0.60	0.99	0.99	0.99	0.04	0.19	0.19	0.12	0.32	0.00
Sat Flow, veh/h	1781	1591	236	1181	3031	522	1781	3630	15	1781	1870	1585
Grp Volume(v), veh/h	105	0	201	34	1018	1071	38	119	125	337	540	0
Grp Sat Flow(s),veh/h/ln	1781	0	1828	1181	1777	1776	1781	1777	1868	1781	1870	1585
Q Serve(g_s), s	3.9	0.0	6.9	0.0	69.3	69.3	2.4	8.2	8.2	12.5	33.3	0.0
Cycle Q Clear(g_c), s	3.9	0.0	6.9	0.0	69.3	69.3	2.4	8.2	8.2	12.5	33.3	0.0
Prop In Lane	1.00		0.13	1.00		0.29	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	172	0	1101	636	880	879	121	334	351	358	445	
V/C Ratio(X)	0.61	0.00	0.18	0.05	1.16	1.22	0.31	0.36	0.36	0.94	1.21	
Avail Cap(c_a), veh/h	172	0	1101	636	880	879	121	334	351	358	445	
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.33	1.33	1.33
Upstream Filter(I)	0.09	0.00	0.09	0.26	0.26	0.26	0.67	0.67	0.67	1.00	1.00	0.00
Uniform Delay (d), s/veh	32.7	0.0	12.4	0.4	0.7	0.7	45.2	49.5	49.5	48.6	47.9	0.0
Incr Delay (d2), s/veh	1.5	0.0	0.0	0.0	74.4	101.1	4.5	2.0	1.9	35.0	115.4	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	0.0	2.8	0.0	18.5	25.0	1.2	3.8	4.0	9.5	29.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.1	0.0	12.5	0.4	75.1	101.8	49.7	51.5	51.4	83.6	163.2	0.0
LnGrp LOS	C	A	B	A	F	F	D	D	D	F	F	
Approach Vol, veh/h		306			2123			282			877	A
Approach Delay, s/veh		19.9			87.4			51.2			132.6	
Approach LOS		B			F			D			F	
Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	15.0	75.0	18.0	32.0		90.0	11.0	39.0				
Change Period (Y+Rc), s	5.5	* 5.7	5.5	* 5.7		* 5.7	5.5	* 5.7				
Max Green Setting (Gmax), s	9.5	* 69	12.5	* 26		* 84	5.5	* 33				
Max Q Clear Time (g_c+I1), s	5.9	71.3	14.5	10.2		8.9	4.4	35.3				
Green Ext Time (p_c), s	0.1	0.0	0.0	0.8		1.3	0.0	0.0				

## Intersection Summary

HCM 6th Ctrl Delay	89.9
HCM 6th LOS	F

## Notes

- \* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
- Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Queues

111: Jefferson St & Brorein St

01/19/2022



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	105	201	34	2089	38	244	337	540	93
v/c Ratio	0.61	0.18	0.06	1.21	0.31	0.37	0.98	1.22	0.20
Control Delay	30.4	2.6	21.4	125.8	33.9	44.8	70.1	148.3	3.4
Queue Delay	0.0	0.1	0.0	3.1	4.2	0.0	38.5	0.0	0.1
Total Delay	30.4	2.8	21.4	128.9	38.1	44.8	108.6	148.3	3.4
Queue Length 50th (ft)	49	56	14	~671	22	95	135	~596	1
Queue Length 95th (ft)	m11	m4	m17	m#773	m31	m143	#401	#813	m14
Internal Link Dist (ft)		494		148		443		116	
Turn Bay Length (ft)	150		50		100		50		
Base Capacity (vph)	173	1104	582	1721	123	664	345	443	458
Starvation Cap Reductn	0	0	0	327	0	0	0	0	0
Spillback Cap Reductn	0	335	0	900	44	0	49	0	34
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.26	0.06	2.54	0.48	0.37	1.14	1.22	0.22

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary  
 112: Nebraska Ave & Brorein St

01/19/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↕			↕			↕	
Traffic Volume (veh/h)	77	317	78	17	1490	5	307	81	96	19	125	156
Future Volume (veh/h)	77	317	78	17	1490	5	307	81	96	19	125	156
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	84	345	85	18	1620	5	334	88	104	21	136	170
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	192	717	177	374	1799	6	318	73	86	56	330	389
Arrive On Green	0.50	0.50	0.50	0.99	0.99	0.99	0.42	0.42	0.42	0.42	0.42	0.42
Sat Flow, veh/h	310	1449	357	958	3634	11	650	171	203	67	780	917
Grp Volume(v), veh/h	84	0	430	18	792	833	526	0	0	327	0	0
Grp Sat Flow(s),veh/h/ln	310	0	1806	958	1777	1868	1024	0	0	1764	0	0
Q Serve(g_s), s	28.4	0.0	22.1	0.9	5.7	5.8	40.2	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	34.2	0.0	22.1	23.0	5.7	5.8	59.3	0.0	0.0	19.1	0.0	0.0
Prop In Lane	1.00		0.20	1.00		0.01	0.63		0.20	0.06		0.52
Lane Grp Cap(c), veh/h	192	0	894	374	880	925	476	0	0	775	0	0
V/C Ratio(X)	0.44	0.00	0.48	0.05	0.90	0.90	1.11	0.00	0.00	0.42	0.00	0.00
Avail Cap(c_a), veh/h	192	0	894	374	880	925	476	0	0	775	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.68	0.00	0.68	0.59	0.59	0.59	0.98	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	28.6	0.0	23.4	4.2	0.4	0.4	46.8	0.0	0.0	28.8	0.0	0.0
Incr Delay (d2), s/veh	4.9	0.0	1.3	0.1	9.1	8.7	72.7	0.0	0.0	1.7	0.0	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.0	9.8	0.1	2.5	2.5	26.9	0.0	0.0	8.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.5	0.0	24.7	4.3	9.5	9.1	119.6	0.0	0.0	30.4	0.0	0.0
LnGrp LOS	C	A	C	A	A	A	F	A	A	C	A	A
Approach Vol, veh/h		514			1643			526				327
Approach Delay, s/veh		26.1			9.2			119.6				30.4
Approach LOS		C			A			F				C
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		75.0		65.0		75.0		65.0				
Change Period (Y+Rc), s		* 5.7		* 5.7		* 5.7		* 5.7				
Max Green Setting (Gmax), s		* 69		* 59		* 69		* 59				
Max Q Clear Time (g_c+I1), s		25.0		61.3		36.2		21.1				
Green Ext Time (p_c), s		18.7		0.0		5.5		2.5				

Intersection Summary

HCM 6th Ctrl Delay	33.7
HCM 6th LOS	C

Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Queues

112: Nebraska Ave & Brorein St

01/19/2022



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	84	430	18	1625	526	327
v/c Ratio	1.58	0.48	0.05	0.93	1.24	0.46
Control Delay	351.8	32.3	6.7	25.2	159.5	30.5
Queue Delay	0.0	44.0	0.0	45.6	4.4	1.9
Total Delay	351.8	76.3	6.7	70.8	163.9	32.4
Queue Length 50th (ft)	~104	250	4	689	~589	203
Queue Length 95th (ft)	m#144	m280	m5	#851	#816	293
Internal Link Dist (ft)		148		203	457	414
Turn Bay Length (ft)	50		70			
Base Capacity (vph)	53	901	359	1751	423	704
Starvation Cap Reductn	0	498	0	182	0	0
Spillback Cap Reductn	0	0	0	462	141	235
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.58	1.07	0.05	1.26	1.87	0.70

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

# HCM 6th Signalized Intersection Summary

701: Water St

01/19/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↕		↖	↗		↖	↗	
Traffic Volume (veh/h)	27	155	250	25	1400	181	72	82	32	5	160	35
Future Volume (veh/h)	27	155	250	25	1400	181	72	82	32	5	160	35
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	29	168	272	27	1522	197	78	89	35	5	174	38
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	137	445	720	707	2194	280	211	351	138	207	279	61
Arrive On Green	1.00	1.00	1.00	0.46	0.46	0.46	0.02	0.09	0.09	0.19	0.19	0.19
Sat Flow, veh/h	283	643	1040	949	3169	405	1781	1278	502	1267	1487	325
Grp Volume(v), veh/h	29	0	440	27	845	874	78	0	124	5	0	212
Grp Sat Flow(s),veh/h/ln	283	0	1683	949	1777	1797	1781	0	1780	1267	0	1812
Q Serve(g_s), s	9.5	0.0	0.0	2.2	52.4	54.2	0.0	0.0	9.1	0.5	0.0	15.1
Cycle Q Clear(g_c), s	64.1	0.0	0.0	2.4	52.4	54.2	0.0	0.0	9.1	9.6	0.0	15.1
Prop In Lane	1.00		0.62	1.00		0.23	1.00		0.28	1.00		0.18
Lane Grp Cap(c), veh/h	137	0	1165	707	1230	1244	211	0	489	207	0	340
V/C Ratio(X)	0.21	0.00	0.38	0.04	0.69	0.70	0.37	0.00	0.25	0.02	0.00	0.62
Avail Cap(c_a), veh/h	137	0	1165	707	1230	1244	211	0	489	207	0	340
HCM Platoon Ratio	1.67	1.67	1.67	0.67	0.67	0.67	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	0.87	0.00	0.87	0.09	0.09	0.09	0.97	0.00	0.97	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.0	0.0	0.0	12.2	25.6	26.1	61.2	0.0	50.3	54.0	0.0	52.3
Incr Delay (d2), s/veh	3.0	0.0	0.8	0.0	0.3	0.3	4.8	0.0	1.2	0.2	0.0	8.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	0.3	0.5	23.5	24.6	3.0	0.0	4.5	0.2	0.0	7.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.1	0.0	0.8	12.3	25.9	26.4	65.9	0.0	51.5	54.3	0.0	60.6
LnGrp LOS	C	A	A	B	C	C	E	A	D	D	A	E
Approach Vol, veh/h		469			1746			202				217
Approach Delay, s/veh		2.1			25.9			57.1				60.5
Approach LOS		A			C			E				E
Timer - Assigned Phs		2		4		6	7	8				
Phs Duration (G+Y+Rc), s		102.8		44.2		102.8	12.2	32.0				
Change Period (Y+Rc), s		* 5.7		* 5.7		* 5.7	* 5.7	* 5.7				
Max Green Setting (Gmax), s		* 90		* 38		* 90	* 6.5	* 26				
Max Q Clear Time (g_c+I1), s		56.2		11.1		66.1	2.0	17.1				
Green Ext Time (p_c), s		18.6		0.7		3.9	0.1	0.8				

## Intersection Summary

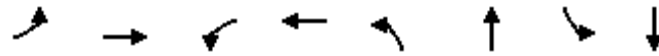
HCM 6th Ctrl Delay	26.9
HCM 6th LOS	C

## Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Queues  
701: Water St

01/19/2022



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	29	440	27	1719	78	124	5	212
v/c Ratio	0.35	0.39	0.05	0.76	0.29	0.25	0.02	0.61
Control Delay	21.0	7.4	8.5	13.1	43.0	35.0	47.0	58.9
Queue Delay	0.0	0.4	0.0	22.8	0.0	0.0	0.0	0.0
Total Delay	21.0	7.8	8.5	35.9	43.0	35.0	47.0	58.9
Queue Length 50th (ft)	9	87	7	352	56	84	4	173
Queue Length 95th (ft)	m18	m110	m7	m266	m87	m129	17	262
Internal Link Dist (ft)		203		452		462		361
Turn Bay Length (ft)	70		70		150		150	
Base Capacity (vph)	83	1131	539	2251	269	498	220	346
Starvation Cap Reductn	0	296	0	595	0	0	0	0
Spillback Cap Reductn	0	0	0	495	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.53	0.05	1.04	0.29	0.25	0.02	0.61

Intersection Summary

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



HCM 6th Signalized Intersection Summary  
 120: Meridian Ave & Cumberland Ave

01/19/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗			↖	↗	↖	↗		↖	↗	↖
Traffic Volume (veh/h)	125	25	37	11	358	141	199	458	90	177	682	1065
Future Volume (veh/h)	125	25	37	11	358	141	199	458	90	177	682	1065
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	136	27	40	12	389	0	216	498	98	192	741	1158
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	229	213	315	34	574		193	1194	234	606	1833	817
Arrive On Green	0.31	0.31	0.31	0.31	0.31	0.00	0.07	0.81	0.81	0.05	0.17	0.17
Sat Flow, veh/h	995	681	1008	25	1836	1585	1781	2963	580	1781	3554	1585
Grp Volume(v), veh/h	136	0	67	401	0	0	216	298	298	192	741	1158
Grp Sat Flow(s),veh/h/ln	995	0	1689	1860	0	1585	1781	1777	1766	1781	1777	1585
Q Serve(g_s), s	10.8	0.0	4.0	2.0	0.0	0.0	5.0	6.9	6.9	7.6	26.0	72.2
Cycle Q Clear(g_c), s	37.1	0.0	4.0	26.3	0.0	0.0	5.0	6.9	6.9	7.6	26.0	72.2
Prop In Lane	1.00		0.60	0.03		1.00	1.00		0.33	1.00		1.00
Lane Grp Cap(c), veh/h	229	0	528	609	0		193	716	711	606	1833	817
V/C Ratio(X)	0.59	0.00	0.13	0.66	0.00		1.12	0.42	0.42	0.32	0.40	1.42
Avail Cap(c_a), veh/h	229	0	528	609	0		193	716	711	606	1833	817
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	0.33	0.33	0.33
Upstream Filter(l)	0.93	0.00	0.93	1.00	0.00	0.00	0.64	0.64	0.64	0.85	0.85	0.85
Uniform Delay (d), s/veh	51.1	0.0	34.4	42.1	0.0	0.0	40.9	8.8	8.8	17.0	38.9	58.1
Incr Delay (d2), s/veh	10.2	0.0	0.5	5.5	0.0	0.0	86.9	1.1	1.2	1.2	0.6	193.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.2	0.0	1.7	13.2	0.0	0.0	9.1	2.3	2.3	3.5	12.5	74.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.3	0.0	34.9	47.6	0.0	0.0	127.7	9.9	10.0	18.2	39.5	251.7
LnGrp LOS	E	A	C	D	A		F	A	A	B	D	F
Approach Vol, veh/h		203			401	A		812			2091	
Approach Delay, s/veh		52.6			47.6			41.3			155.1	
Approach LOS		D			D			D			F	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.4	78.6		50.0	27.2	62.8		50.0				
Change Period (Y+Rc), s	6.4	6.4		* 6.2	6.4	6.4		* 6.2				
Max Green Setting (Gmax), s	5.0	72.2		* 44	20.8	56.4		* 44				
Max Q Clear Time (g_c+I1), s	7.0	74.2		39.1	9.6	8.9		28.3				
Green Ext Time (p_c), s	0.0	0.0		0.4	0.6	3.8		2.3				

Intersection Summary

HCM 6th Ctrl Delay	110.5
HCM 6th LOS	F

Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.  
 Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Queues

120: Meridian Ave & Cumberland Ave

01/19/2022



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	136	67	401	153	216	596	192	741	1158
v/c Ratio	0.87	0.12	0.69	0.26	0.64	0.43	0.37	0.41	1.26
Control Delay	85.3	16.6	49.7	10.0	19.2	20.5	4.7	4.4	143.4
Queue Delay	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.7
Total Delay	85.3	16.6	49.7	10.0	19.6	20.5	4.7	4.4	144.0
Queue Length 50th (ft)	102	21	321	17	59	113	9	20	~1253
Queue Length 95th (ft)	#247	60	442	70	m82	m142	34	73	#1597
Internal Link Dist (ft)		452	888			460		712	
Turn Bay Length (ft)	100			100	200		250		
Base Capacity (vph)	156	557	578	581	340	1402	519	1825	921
Starvation Cap Reductn	0	0	0	0	0	0	0	0	106
Spillback Cap Reductn	0	0	0	0	12	0	0	0	29
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.87	0.12	0.69	0.26	0.66	0.43	0.37	0.41	1.42













Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

# HCM Signalized Intersection Capacity Analysis

## 102: Florida Ave & Whiting St

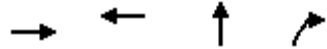
01/19/2022

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↔↔			↔↔			↔↔↔	↔				
Traffic Volume (vph)	114	456	0	0	627	112	85	1827	86	0	0	0	
Future Volume (vph)	114	456	0	0	627	112	85	1827	86	0	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		6.0			6.0			5.7	5.7				
Lane Util. Factor		0.95			0.95			0.91	1.00				
Frt		1.00			0.98			1.00	0.85				
Flt Protected		0.99			1.00			1.00	1.00				
Satd. Flow (prot)		3504			3459			5074	1583				
Flt Permitted		0.54			1.00			1.00	1.00				
Satd. Flow (perm)		1919			3459			5074	1583				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	124	496	0	0	682	122	92	1986	93	0	0	0	
RTOR Reduction (vph)	0	0	0	0	10	0	0	0	18	0	0	0	
Lane Group Flow (vph)	0	620	0	0	794	0	0	2078	75	0	0	0	
Turn Type	Perm	NA			NA		Perm	NA	Perm				
Protected Phases		4			4			2					
Permitted Phases	4						2		2				
Actuated Green, G (s)		49.0			49.0			74.3	74.3				
Effective Green, g (s)		49.0			49.0			74.3	74.3				
Actuated g/C Ratio		0.35			0.35			0.53	0.53				
Clearance Time (s)		6.0			6.0			5.7	5.7				
Vehicle Extension (s)		3.0			3.0			3.0	3.0				
Lane Grp Cap (vph)		671			1210			2692	840				
v/s Ratio Prot					0.23								
v/s Ratio Perm		c0.32						0.41	0.05				
v/c Ratio		0.99dl			0.66			0.77	0.09				
Uniform Delay, d1		43.7			38.4			26.1	16.2				
Progression Factor		1.00			0.62			1.00	1.00				
Incremental Delay, d2		20.4			0.3			2.2	0.2				
Delay (s)		64.1			24.0			28.3	16.4				
Level of Service		E			C			C	B				
Approach Delay (s)		64.1			24.0			27.8			0.0		
Approach LOS		E			C			C			A		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			33.2									HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.81										
Actuated Cycle Length (s)			140.0									Sum of lost time (s)	13.7
Intersection Capacity Utilization			88.6%									ICU Level of Service	E
Analysis Period (min)			15										
dl Defacto Left Lane. Recode with 1 though lane as a left lane.													
c Critical Lane Group													

# Queues

## 102: Florida Ave & Whiting St

01/19/2022



Lane Group	EBT	WBT	NBT	NBR
Lane Group Flow (vph)	620	804	2078	93
v/c Ratio	0.99dl	0.66	0.77	0.11
Control Delay	64.4	23.8	28.6	10.0
Queue Delay	0.0	0.4	6.0	0.0
Total Delay	64.4	24.2	34.6	10.0
Queue Length 50th (ft)	284	126	534	23
Queue Length 95th (ft)	#407	m75	595	52
Internal Link Dist (ft)	821	519	567	
Turn Bay Length (ft)				100
Base Capacity (vph)	671	1220	2693	858
Starvation Cap Reductn	0	116	568	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.92	0.73	0.98	0.11

### Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

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

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

# HCM Signalized Intersection Capacity Analysis

## 103: Morgan St & Whiting St

01/19/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	106	295	155	754	103	88	527	49	43	534	75
Future Volume (vph)	46	106	295	155	754	103	88	527	49	43	534	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.8	5.8		5.8	5.8			5.7			5.7	
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	
Frt	1.00	0.89		1.00	0.98			0.99			0.98	
Flt Protected	0.95	1.00		0.95	1.00			0.99			1.00	
Satd. Flow (prot)	1770	1657		1770	1829			3477			3466	
Flt Permitted	0.12	1.00		0.12	1.00			0.62			0.77	
Satd. Flow (perm)	218	1657		218	1829			2167			2668	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	50	115	321	168	820	112	96	573	53	47	580	82
RTOR Reduction (vph)	0	72	0	0	4	0	0	4	0	0	7	0
Lane Group Flow (vph)	50	364	0	168	928	0	0	718	0	0	702	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	4			2			2	
Permitted Phases	4			4			2			2		
Actuated Green, G (s)	34.2	34.2		69.4	34.2			53.3			53.3	
Effective Green, g (s)	34.2	34.2		69.4	34.2			53.3			53.3	
Actuated g/C Ratio	0.24	0.24		0.50	0.24			0.38			0.38	
Clearance Time (s)	5.8	5.8		5.8	5.8			5.7			5.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	53	404		498	446			825			1015	
v/s Ratio Prot		0.22		c0.08	c0.51							
v/s Ratio Perm	0.23			0.08				c0.33			0.26	
v/c Ratio	0.94	0.90		0.34	2.08			0.87			0.69	
Uniform Delay, d1	51.9	51.3		22.9	52.9			40.1			36.4	
Progression Factor	0.90	0.79		1.49	0.74			1.39			1.00	
Incremental Delay, d2	79.6	17.1		1.6	493.3			8.0			3.9	
Delay (s)	126.4	57.7		35.8	532.4			63.8			40.3	
Level of Service	F	E		D	F			E			D	
Approach Delay (s)		64.8			456.6			63.8			40.3	
Approach LOS		E			F			E			D	

### Intersection Summary

HCM 2000 Control Delay	201.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	17.3
Intersection Capacity Utilization	110.5%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Queues

103: Morgan St & Whiting St

01/19/2022



















Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	50	436	168	932	722	709
v/c Ratio	0.94	0.92	0.34	2.07	0.87	0.69
Control Delay	129.0	49.2	31.5	512.7	63.6	40.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	129.0	49.2	31.5	512.7	63.6	40.1
Queue Length 50th (ft)	29	131	77	~1364	359	279
Queue Length 95th (ft)	m#63	m#198	146	#1606	#443	355
Internal Link Dist (ft)		519		503	563	436
Turn Bay Length (ft)			150			
Base Capacity (vph)	53	476	498	450	829	1023
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.94	0.92	0.34	2.07	0.87	0.69

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis  
 104: Jefferson St & Whiting St

01/19/2022

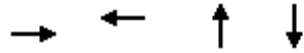
													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	8	141	104	70	566	163	89	238	17	29	709	119	
Future Volume (vph)	8	141	104	70	566	163	89	238	17	29	709	119	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		6.1			6.1			6.1			6.0		
Lane Util. Factor		0.95			0.95			0.95			0.95		
Frt		0.94			0.97			0.99			0.98		
Flt Protected		1.00			1.00			0.99			1.00		
Satd. Flow (prot)		3316			3416			3469			3460		
Flt Permitted		0.92			0.87			0.53			0.92		
Satd. Flow (perm)		3052			2988			1856			3204		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	9	153	113	76	615	177	97	259	18	32	771	129	
RTOR Reduction (vph)	0	73	0	0	18	0	0	3	0	0	8	0	
Lane Group Flow (vph)	0	202	0	0	850	0	0	371	0	0	924	0	
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		Perm	NA		
Protected Phases		8		7	4		1	6			2		
Permitted Phases	8			4			6			2			
Actuated Green, G (s)		50.0			50.0			62.9			63.0		
Effective Green, g (s)		50.0			50.0			62.9			63.0		
Actuated g/C Ratio		0.36			0.36			0.45			0.45		
Clearance Time (s)		6.1			6.1			6.1			6.0		
Vehicle Extension (s)		3.0			3.0			3.0			3.0		
Lane Grp Cap (vph)		1090			1067			833			1441		
v/s Ratio Prot													
v/s Ratio Perm		0.07			c0.28			0.20			c0.29		
v/c Ratio		0.19			0.80			0.45			0.64		
Uniform Delay, d1		31.0			40.4			26.5			29.8		
Progression Factor		1.79			0.34			0.88			1.00		
Incremental Delay, d2		0.1			4.0			0.3			2.2		
Delay (s)		55.6			17.9			23.8			32.0		
Level of Service		E			B			C			C		
Approach Delay (s)		55.6			17.9			23.8			32.0		
Approach LOS		E			B			C			C		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			28.4									HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.70										
Actuated Cycle Length (s)			140.0									Sum of lost time (s)	26.0
Intersection Capacity Utilization			85.4%									ICU Level of Service	E
Analysis Period (min)			15										

c Critical Lane Group

# Queues

## 104: Jefferson St & Whiting St

01/19/2022



Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	275	868	374	932
v/c Ratio	0.24	0.80	0.45	0.64
Control Delay	31.1	19.3	24.9	31.8
Queue Delay	0.0	0.1	0.0	0.0
Total Delay	31.1	19.4	24.9	31.8
Queue Length 50th (ft)	87	102	114	335
Queue Length 95th (ft)	m100	101	m132	409
Internal Link Dist (ft)	503	427	450	207
Turn Bay Length (ft)				
Base Capacity (vph)	1208	1294	836	1449
Starvation Cap Reductn	0	43	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.23	0.69	0.45	0.64

### Intersection Summary

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



HCM Signalized Intersection Capacity Analysis  
715: Selmon Expy Off-Ramp & Whiting St

01/19/2022



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	↗
Traffic Volume (vph)	191	0	0	697	100	500
Future Volume (vph)	191	0	0	697	100	500
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.7			5.7	6.0	6.0
Lane Util. Factor	0.95			0.95	1.00	0.88
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3539			3539	1770	2787
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3539			3539	1770	2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	208	0	0	758	109	543
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	208	0	0	758	109	543
Turn Type	NA			NA	Prot	custom
Protected Phases	5			2	4	4
Permitted Phases						
Actuated Green, G (s)	13.7			84.3	44.0	114.6
Effective Green, g (s)	13.7			84.3	44.0	108.9
Actuated g/C Ratio	0.10			0.60	0.31	0.78
Clearance Time (s)	5.7			5.7	6.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	346			2130	556	2167
v/s Ratio Prot	c0.06			c0.21	0.06	c0.19
v/s Ratio Perm						
v/c Ratio	0.60			0.36	0.20	0.25
Uniform Delay, d1	60.5			14.1	35.1	4.3
Progression Factor	0.73			0.54	1.00	1.00
Incremental Delay, d2	2.8			0.4	0.8	0.3
Delay (s)	47.1			8.0	35.9	4.6
Level of Service	D			A	D	A
Approach Delay (s)	47.1			8.0	9.8	
Approach LOS	D			A	A	

Intersection Summary

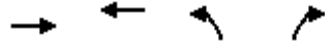
HCM 2000 Control Delay	13.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	17.4
Intersection Capacity Utilization	37.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

# Queues

## 715: Selmon Expy Off-Ramp & Whiting St

01/19/2022



Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	208	758	109	543
v/c Ratio	0.60	0.36	0.20	0.24
Control Delay	51.2	8.1	36.3	3.3
Queue Delay	0.0	0.3	0.0	0.0
Total Delay	51.2	8.4	36.3	3.3
Queue Length 50th (ft)	69	99	73	51
Queue Length 95th (ft)	89	m53	122	80
Internal Link Dist (ft)	427	276	783	
Turn Bay Length (ft)			350	350
Base Capacity (vph)	1625	2130	556	2280
Starvation Cap Reductn	0	722	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.13	0.54	0.20	0.24

### Intersection Summary

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

HCM 6th Signalized Intersection Summary  
 11: Water St/Brush St & Whiting St

01/19/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗		↖	↗			↕	
Traffic Volume (veh/h)	165	392	134	72	593	83	22	95	83	50	255	82
Future Volume (veh/h)	165	392	134	72	593	83	22	95	83	50	255	82
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	179	426	146	78	645	90	24	103	90	54	277	89
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	482	2089	966	581	1749	244	165	237	207	64	227	70
Arrive On Green	0.12	1.00	1.00	0.03	0.56	0.56	0.02	0.26	0.26	0.20	0.20	0.20
Sat Flow, veh/h	1781	3554	1585	1781	3132	436	1781	921	805	177	1166	361
Grp Volume(v), veh/h	179	426	146	78	365	370	24	0	193	420	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1792	1781	0	1726	1704	0	0
Q Serve(g_s), s	6.2	0.0	0.0	2.6	16.0	16.1	1.5	0.0	13.1	22.4	0.0	0.0
Cycle Q Clear(g_c), s	6.2	0.0	0.0	2.6	16.0	16.1	1.5	0.0	13.1	27.3	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.24	1.00		0.47	0.13		0.21
Lane Grp Cap(c), veh/h	482	2089	966	581	992	1000	165	0	444	361	0	0
V/C Ratio(X)	0.37	0.20	0.15	0.13	0.37	0.37	0.15	0.00	0.43	1.16	0.00	0.00
Avail Cap(c_a), veh/h	923	2089	966	692	992	1000	283	0	558	361	0	0
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.95	0.95	0.95	0.92	0.92	0.92	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	11.5	0.0	0.0	12.2	17.2	17.2	42.0	0.0	43.5	57.3	0.0	0.0
Incr Delay (d2), s/veh	0.5	0.2	0.3	0.1	1.0	1.0	0.4	0.0	0.7	99.3	0.0	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	0.1	0.1	1.1	6.8	6.9	0.7	0.0	5.8	23.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.0	0.2	0.3	12.3	18.2	18.2	42.4	0.0	44.1	156.7	0.0	0.0
LnGrp LOS	B	A	A	B	B	B	D	A	D	F	A	A
Approach Vol, veh/h		751			813			217			420	
Approach Delay, s/veh		3.0			17.6			43.9			156.7	
Approach LOS		A			B			D			F	
Timer - Assigned Phs	1	2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.4	83.9		41.7	10.3	88.0	8.7	33.0				
Change Period (Y+Rc), s	* 5.7	* 5.7		* 5.7	5.5	* 5.7	* 5.7	* 5.7				
Max Green Setting (Gmax), s	* 43	* 34		* 45	13.5	* 64	* 12	* 27				
Max Q Clear Time (g_c+I1), s	8.2	18.1		15.1	4.6	2.0	3.5	29.3				
Green Ext Time (p_c), s	0.5	4.3		1.3	0.1	3.7	0.0	0.0				

Intersection Summary

HCM 6th Ctrl Delay	41.8
HCM 6th LOS	D

Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Queues

11: Water St/Brush St & Whiting St

01/19/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	179	426	146	78	735	24	193	420
v/c Ratio	0.44	0.24	0.15	0.15	0.46	0.12	0.33	1.07
Control Delay	13.4	14.5	0.6	17.3	38.5	34.0	31.3	114.1
Queue Delay	0.0	0.4	0.0	0.0	0.7	0.0	0.0	0.0
Total Delay	13.4	14.9	0.6	17.3	39.2	34.0	31.3	114.1
Queue Length 50th (ft)	49	79	0	45	295	15	109	~415
Queue Length 95th (ft)	75	106	5	79	373	38	178	#654
Internal Link Dist (ft)		276			426		126	215
Turn Bay Length (ft)	100		200	300		50		
Base Capacity (vph)	688	1762	1046	603	1604	247	582	393
Starvation Cap Reductn	22	848	0	0	513	0	0	0
Spillback Cap Reductn	0	0	0	0	57	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.47	0.14	0.13	0.67	0.10	0.33	1.07

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

# HCM Signalized Intersection Capacity Analysis

## 7: Meridian Ave & Whiting St

01/19/2022



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	300	225	295	543	1711	453
Future Volume (vph)	300	225	295	543	1711	453
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	6.9	6.4	6.6	4.0
Lane Util. Factor	0.97	1.00	1.00	0.91	0.86	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3433	1583	1770	5085	6408	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3433	1583	1770	5085	6408	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	326	245	321	590	1860	492
RTOR Reduction (vph)	0	186	0	0	0	0
Lane Group Flow (vph)	326	59	321	590	1860	492
Turn Type	Prot	Perm	Prot	NA	NA	Free
Protected Phases	7 8		1	6	2	
Permitted Phases		7 8				Free
Actuated Green, G (s)	33.6	33.6	46.8	92.3	38.4	140.0
Effective Green, g (s)	33.6	33.6	46.8	92.3	38.4	140.0
Actuated g/C Ratio	0.24	0.24	0.33	0.66	0.27	1.00
Clearance Time (s)			6.9	6.4	6.6	
Vehicle Extension (s)			3.0	3.0	3.0	
Lane Grp Cap (vph)	823	379	591	3352	1757	1583
v/s Ratio Prot	c0.09		c0.18	0.12	c0.29	
v/s Ratio Perm		0.04				c0.31
v/c Ratio	0.40	0.16	0.54	0.18	1.06	0.31
Uniform Delay, d1	44.7	42.0	37.9	9.2	50.8	0.0
Progression Factor	0.72	1.36	0.48	0.25	1.00	1.00
Incremental Delay, d2	0.3	0.2	1.0	0.1	38.9	0.5
Delay (s)	32.7	57.1	19.0	2.4	89.7	0.5
Level of Service	C	E	B	A	F	A
Approach Delay (s)	43.1			8.3	71.1	
Approach LOS	D			A	E	

### Intersection Summary

HCM 2000 Control Delay	52.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.7
Intersection Capacity Utilization	65.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Queues

7: Meridian Ave & Whiting St

01/19/2022



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	326	245	321	590	1860	492
v/c Ratio	0.37	0.42	0.54	0.18	1.06	0.31
Control Delay	31.8	8.0	22.3	2.6	87.2	0.5
Queue Delay	0.0	0.0	3.1	0.2	17.4	0.0
Total Delay	31.8	8.0	25.4	2.7	104.7	0.5
Queue Length 50th (ft)	115	33	88	16	~538	0
Queue Length 95th (ft)	m143	m87	128	32	#614	0
Internal Link Dist (ft)	426			229	186	
Turn Bay Length (ft)	200	250	150			
Base Capacity (vph)	1581	861	591	3351	1757	1583
Starvation Cap Reductn	0	0	174	1800	0	0
Spillback Cap Reductn	0	7	0	0	195	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.29	0.77	0.38	1.19	0.31

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis  
 107: Meridian Ave & Whiting St

01/19/2022



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		↑↑↑		←	↑↑↑
Traffic Volume (vph)	13	163	674	49	25	1911
Future Volume (vph)	13	163	674	49	25	1911
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.7		6.4		5.5	6.9
Lane Util. Factor	1.00		0.91		1.00	0.91
Frt	0.87		0.99		1.00	1.00
Flt Protected	1.00		1.00		0.95	1.00
Satd. Flow (prot)	1624		5034		1770	5085
Flt Permitted	1.00		1.00		0.33	1.00
Satd. Flow (perm)	1624		5034		618	5085
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	14	177	733	53	27	2077
RTOR Reduction (vph)	165	0	4	0	0	0
Lane Group Flow (vph)	26	0	782	0	27	2077
Turn Type	Prot		NA		custom	NA
Protected Phases	8		6		7	1 2 7
Permitted Phases					1 2	
Actuated Green, G (s)	9.6		92.3		110.6	117.2
Effective Green, g (s)	9.6		92.3		103.7	110.6
Actuated g/C Ratio	0.07		0.66		0.74	0.79
Clearance Time (s)	7.7		6.4		5.5	
Vehicle Extension (s)	3.0		3.0		3.0	
Lane Grp Cap (vph)	111		3318		609	4017
v/s Ratio Prot	c0.02		0.16		0.01	c0.41
v/s Ratio Perm					0.03	
v/c Ratio	0.24		0.24		0.04	0.52
Uniform Delay, d1	61.7		9.6		5.7	5.2
Progression Factor	2.07		1.61		0.24	1.93
Incremental Delay, d2	1.1		0.2		0.0	0.0
Delay (s)	128.7		15.6		1.4	10.1
Level of Service	F		B		A	B
Approach Delay (s)	128.7		15.6			10.0
Approach LOS	F		B			A

Intersection Summary

HCM 2000 Control Delay	18.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.7
Intersection Capacity Utilization	59.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

# Queues

## 107: Meridian Ave & Whiting St

01/19/2022



Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	191	786	27	2077
v/c Ratio	0.69	0.24	0.04	0.49
Control Delay	35.1	16.1	0.7	7.7
Queue Delay	0.0	0.0	0.0	2.0
Total Delay	35.1	16.1	0.7	9.6
Queue Length 50th (ft)	31	166	1	663
Queue Length 95th (ft)	119	m211	m1	m597
Internal Link Dist (ft)	878	712		229
Turn Bay Length (ft)				
Base Capacity (vph)	572	3321	645	4205
Starvation Cap Reductn	0	0	0	1905
Spillback Cap Reductn	11	36	0	279
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.34	0.24	0.04	0.90

### Intersection Summary

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



# HCS7 Two-Way Stop-Control Report

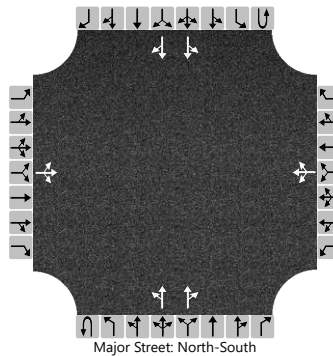
## General Information

Analyst	H.W. Lochner
Agency/Co.	
Date Performed	09/24/2021
Analysis Year	2026
Time Analyzed	AM Peak Hour
Intersection Orientation	North-South
Project Description	Whiting PD&E Study

## Site Information

Intersection	EWashingtonSt&JeffersonSt
Jurisdiction	FDOT, District 7
East/West Street	E Washington St
North/South Street	Jefferson St
Peak Hour Factor	0.95
Analysis Time Period (hrs)	1.00

## Lanes



## Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound				
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Movement																	
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6	
Number of Lanes		0	1	0		0	1	0	0	0	2	0	0	0	2	0	
Configuration			LTR				LTR			LT		TR		LT		TR	
Volume (veh/h)		1	33	152		65	48	182		40	369	5		19	640	95	
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2			
Proportion Time Blocked																	
Percent Grade (%)		0				0											
Right Turn Channelized																	
Median Type   Storage		Undivided															

## Critical and Follow-up Headways

Base Critical Headway (sec)		7.5	6.5	6.9		7.5	6.5	6.9		4.1				4.1		
Critical Headway (sec)		7.54	6.54	6.94		7.54	6.54	6.94		4.14				4.14		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.52	4.02	3.32		3.52	4.02	3.32		2.22				2.22		

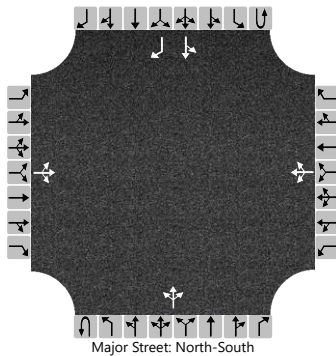
## Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			196				311				42				20		
Capacity, c (veh/h)			396				291				838				1161		
v/c Ratio			0.49				1.07				0.05				0.02		
95% Queue Length, Q <sub>95</sub> (veh)			2.8				27.0				0.2				0.1		
Control Delay (s/veh)			22.9				243.0				9.5				8.2		
Level of Service (LOS)			C				F				A				A		
Approach Delay (s/veh)		22.9				243.0				1.1				0.3			
Approach LOS		C				F				A				A			

# HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	H.W. Lochner	Intersection	EWashingtonSt&BrushSt
Agency/Co.		Jurisdiction	FDOT, District 7
Date Performed	09/24/2021	East/West Street	E Washington St
Analysis Year	2026	North/South Street	Brush St
Time Analyzed	AM Peak Hour	Peak Hour Factor	0.95
Intersection Orientation	North-South	Analysis Time Period (hrs)	1.00
Project Description	Whiting PD&E Study		

## Lanes



## Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound				
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Movement																	
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6	
Number of Lanes		0	1	0		0	1	0		0	1	0		0	1	1	
Configuration			LTR				LTR				LTR			LT		R	
Volume (veh/h)		3	9	39		21	4	1		85	149	21		5	323	166	
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2			
Proportion Time Blocked																	
Percent Grade (%)		0				0											
Right Turn Channelized																Yes	
Median Type   Storage		Undivided															

## Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.12	6.52	6.22		7.12	6.52	6.22		4.12				4.12		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.52	4.02	3.32		3.52	4.02	3.32		2.22				2.22		

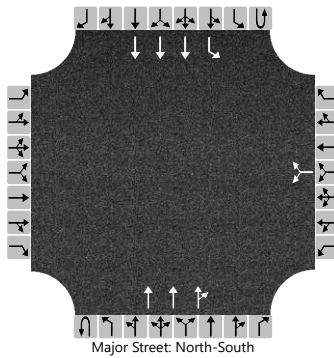
## Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			54				27				89				5		
Capacity, c (veh/h)			554				274				1219				1397		
v/c Ratio			0.10				0.10				0.07				0.00		
95% Queue Length, Q <sub>95</sub> (veh)			0.3				0.3				0.2				0.0		
Control Delay (s/veh)			12.2				19.6				8.2				7.6		
Level of Service (LOS)			B				C				A				A		
Approach Delay (s/veh)		12.2				19.6				3.2				0.1			
Approach LOS		B				C											

# HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	H.W. Lochner	Intersection	MeridianAve&EWashingtonSt
Agency/Co.		Jurisdiction	FDOT, District 7
Date Performed	09/24/2021	East/West Street	Meridian Ave
Analysis Year	2026	North/South Street	E Washington St
Time Analyzed	AM Peak Hour	Peak Hour Factor	0.95
Intersection Orientation	North-South	Analysis Time Period (hrs)	1.00
Project Description	Whiting PD&E Study		

## Lanes



## Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0		0	3	0		0	1	3
Configuration							LR				T	TR		L	T	
Volume (veh/h)						120		130			700	143		0	5	2044
Percent Heavy Vehicles (%)						2		2						0	2	
Proportion Time Blocked																
Percent Grade (%)							0									
Right Turn Channelized																
Median Type   Storage							Left Only									1

## Critical and Follow-up Headways

Base Critical Headway (sec)						6.4		7.1							5.3	
Critical Headway (sec)						5.74		7.14							5.34	
Base Follow-Up Headway (sec)						3.8		3.9							3.1	
Follow-Up Headway (sec)						3.82		3.92							3.12	

















## Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							263								5	
Capacity, c (veh/h)							296								443	
v/c Ratio							0.89								0.01	
95% Queue Length, Q <sub>95</sub> (veh)							13.2								0.0	
Control Delay (s/veh)							88.4								13.2	
Level of Service (LOS)							F								B	
Approach Delay (s/veh)							88.4								0.0	
Approach LOS							F									

# HCM Signalized Intersection Capacity Analysis

114: Florida Ave & Channelside Dr

01/19/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	890	1740	156	0	0	0	0	444	115	0	0	0
Future Volume (vph)	890	1740	156	0	0	0	0	444	115	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.1						6.0	6.0			
Lane Util. Factor	*0.51	*0.76						*0.80	1.00			
Frt	1.00	0.99						1.00	0.85			
Flt Protected	0.95	1.00						1.00	1.00			
Satd. Flow (prot)	1805	2796						2980	1583			
Flt Permitted	0.95	1.00						1.00	1.00			
Satd. Flow (perm)	1805	2796						2980	1583			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	967	1891	170	0	0	0	0	483	125	0	0	0
RTOR Reduction (vph)	202	4	0	0	0	0	0	0	62	0	0	0
Lane Group Flow (vph)	765	2057	0	0	0	0	0	483	63	0	0	0
Turn Type	Prot	NA						NA	Perm			
Protected Phases	1	6						4				
Permitted Phases									4			
Actuated Green, G (s)	64.0	102.9						25.0	25.0			
Effective Green, g (s)	64.0	102.9						25.0	25.0			
Actuated g/C Ratio	0.46	0.74						0.18	0.18			
Clearance Time (s)	6.0	6.1						6.0	6.0			
Vehicle Extension (s)	3.0	3.0						3.0	3.0			
Lane Grp Cap (vph)	825	2055						532	282			
v/s Ratio Prot	0.42	c0.74						c0.16				
v/s Ratio Perm									0.04			
v/c Ratio	0.93	1.00						0.91	0.22			
Uniform Delay, d1	35.8	18.5						56.4	49.2			
Progression Factor	1.00	1.00						1.00	1.00			
Incremental Delay, d2	18.0	20.1						19.2	0.4			
Delay (s)	53.8	38.7						75.5	49.6			
Level of Service	D	D						E	D			
Approach Delay (s)		43.5			0.0			70.2			0.0	
Approach LOS		D			A			E			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			48.0					HCM 2000 Level of Service		D		
HCM 2000 Volume to Capacity ratio			1.04									
Actuated Cycle Length (s)			140.0					Sum of lost time (s)		18.6		
Intersection Capacity Utilization			88.8%					ICU Level of Service		E		
Analysis Period (min)			15									

c Critical Lane Group

# Queues

## 114: Florida Ave & Channelside Dr

01/19/2022



Lane Group	EBL	EBT	NBT	NBR
Lane Group Flow (vph)	967	2061	483	125
v/c Ratio	0.94	1.00	0.91	0.36
Control Delay	39.5	38.8	78.2	24.9
Queue Delay	16.9	0.0	1.6	0.0
Total Delay	56.4	38.8	79.7	24.9
Queue Length 50th (ft)	578	~1108	272	39
Queue Length 95th (ft)	#901	#1450	#393	101
Internal Link Dist (ft)		1290	1157	
Turn Bay Length (ft)				200
Base Capacity (vph)	1027	2059	532	344
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	86	0	10	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.03	1.00	0.93	0.36

### Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis  
 115: Morgan St & Channelside Dr

01/19/2022

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	386	1440	29	5	0	748	0	133	13	5	18	0	
Future Volume (vph)	386	1440	29	5	0	748	0	133	13	5	18	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	5.5	6.2		5.9		5.9		5.9	5.9	5.9	5.9		
Lane Util. Factor	1.00	0.95		1.00		1.00		1.00	1.00	1.00	1.00		
Frt	1.00	1.00		1.00		0.85		1.00	0.85	1.00	1.00		
Flt Protected	0.95	1.00		0.95		1.00		1.00	1.00	0.95	1.00		
Satd. Flow (prot)	1770	3529		1770		1583		1863	1583	1770	1863		
Flt Permitted	0.95	1.00		0.15		1.00		1.00	1.00	0.55	1.00		
Satd. Flow (perm)	1770	3529		281		1583		1863	1583	1019	1863		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	420	1565	32	5	0	813	0	145	14	5	20	0	
RTOR Reduction (vph)	0	1	0	0	0	191	0	0	12	0	0	0	
Lane Group Flow (vph)	420	1596	0	5	0	622	0	145	2	5	20	0	
Turn Type	pm+pt	NA		Perm		Perm		NA	Perm	Perm	NA		
Protected Phases	1	6						4				8	
Permitted Phases	6			2		2			4	8			
Actuated Green, G (s)	103.8	103.8		81.9		81.9		24.1	24.1	24.1	24.1		
Effective Green, g (s)	103.8	103.8		81.9		81.9		24.1	24.1	24.1	24.1		
Actuated g/C Ratio	0.74	0.74		0.59		0.59		0.17	0.17	0.17	0.17		
Clearance Time (s)	5.5	6.2		5.9		5.9		5.9	5.9	5.9	5.9		
Vehicle Extension (s)	3.0	3.0		3.0		3.0		3.0	3.0	3.0	3.0		
Lane Grp Cap (vph)	1312	2616		164		926		320	272	175	320		
v/s Ratio Prot	0.04	c0.45						c0.08				0.01	
v/s Ratio Perm	0.20			0.02		c0.39			0.00	0.00			
v/c Ratio	0.32	0.61		0.03		0.67		0.45	0.01	0.03	0.06		
Uniform Delay, d1	6.1	8.5		12.3		19.9		52.0	48.0	48.2	48.5		
Progression Factor	0.49	0.38		0.96		1.27		1.00	1.00	1.16	1.13		
Incremental Delay, d2	0.0	0.3		0.3		3.2		4.6	0.1	0.2	0.2		
Delay (s)	3.0	3.5		12.0		28.4		56.6	48.1	55.9	54.8		
Level of Service	A	A		B		C		E	D	E	D		
Approach Delay (s)		3.4			28.3			55.9			55.0		
Approach LOS		A			C			E			D		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			13.4									HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.63										
Actuated Cycle Length (s)			140.0									Sum of lost time (s)	17.3
Intersection Capacity Utilization			90.5%									ICU Level of Service	E
Analysis Period (min)			15										

c Critical Lane Group

Queues

115: Morgan St & Channelside Dr

01/19/2022



Lane Group	EBL	EBT	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	420	1597	5	813	145	14	5	20
v/c Ratio	0.32	0.61	0.03	0.73	0.45	0.04	0.03	0.06
Control Delay	3.1	3.6	14.0	14.6	57.2	0.2	56.4	55.2
Queue Delay	0.6	0.8	0.0	1.3	0.0	0.0	0.0	0.0
Total Delay	3.7	4.4	14.0	15.9	57.2	0.2	56.4	55.2
Queue Length 50th (ft)	44	94	2	193	120	0	3	11
Queue Length 95th (ft)	m49	m103	m3	334	191	0	m4	m15
Internal Link Dist (ft)		523			1253			424
Turn Bay Length (ft)	450			10			100	
Base Capacity (vph)	1321	2617	164	1117	320	328	175	320
Starvation Cap Reductn	546	650	0	138	0	0	0	0
Spillback Cap Reductn	62	194	0	60	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.81	0.03	0.83	0.45	0.04	0.03	0.06

Intersection Summary

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

HCM 6th Signalized Intersection Summary  
 116: Channelside Dr & Jefferson St

01/19/2022



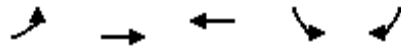
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↕	↑	↕		↕	↕
Traffic Volume (veh/h)	142	1316	486	14	7	267
Future Volume (veh/h)	142	1316	486	14	7	267
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	154	1430	528	15	8	290
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	747	1443	931	26	261	232
Arrive On Green	0.07	0.25	0.68	0.68	0.15	0.15
Sat Flow, veh/h	1781	1870	1810	51	1781	1585
Grp Volume(v), veh/h	154	1430	0	543	8	290
Grp Sat Flow(s),veh/h/ln	1781	1870	0	1861	1781	1585
Q Serve(g_s), s	3.8	106.7	0.0	21.1	0.5	20.5
Cycle Q Clear(g_c), s	3.8	106.7	0.0	21.1	0.5	20.5
Prop In Lane	1.00			0.03	1.00	1.00
Lane Grp Cap(c), veh/h	747	1443	0	957	261	232
V/C Ratio(X)	0.21	0.99	0.00	0.57	0.03	1.25
Avail Cap(c_a), veh/h	747	1443	0	957	261	232
HCM Platoon Ratio	0.33	0.33	1.33	1.33	1.00	1.00
Upstream Filter(I)	0.76	0.76	0.00	0.90	0.99	0.99
Uniform Delay (d), s/veh	8.9	51.7	0.0	14.1	51.2	59.8
Incr Delay (d2), s/veh	0.5	18.7	0.0	2.2	0.2	142.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	61.1	0.0	8.1	0.3	17.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	9.4	70.4	0.0	16.3	51.4	202.3
LnGrp LOS	A	E	A	B	D	F
Approach Vol, veh/h		1584	543		298	
Approach Delay, s/veh		64.4	16.3		198.2	
Approach LOS		E	B		F	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	36.0	78.0			114.0	26.0
Change Period (Y+Rc), s	6.0	6.0			6.0	5.5
Max Green Setting (Gmax), s	30.0	72.0			108.0	20.5
Max Q Clear Time (g_c+I1), s	5.8	23.1			108.7	22.5
Green Ext Time (p_c), s	0.4	4.1			0.0	0.0
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			70.1			
HCM 6th LOS			E			



# Queues

## 116: Channelside Dr & Jefferson St

01/19/2022



Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	154	1430	543	8	290
v/c Ratio	0.23	1.00	0.57	0.03	0.61
Control Delay	1.6	34.6	21.9	52.4	20.0
Queue Delay	0.0	37.4	1.2	0.0	1.0
Total Delay	1.6	72.1	23.1	52.4	21.0
Queue Length 50th (ft)	14	1390	371	7	82
Queue Length 95th (ft)	20	#1658	519	m23	128
Internal Link Dist (ft)		315	131	443	
Turn Bay Length (ft)				100	
Base Capacity (vph)	677	1437	954	259	479
Starvation Cap Reductn	0	197	212	0	0
Spillback Cap Reductn	0	96	41	0	54
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.23	1.15	0.73	0.03	0.68

### Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

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

HCM 6th Signalized Intersection Summary  
 117: Channelside Dr & Nebraska Ave

01/19/2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	217	1106	446	79	8	54
Future Volume (veh/h)	217	1106	446	79	8	54
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	236	1202	485	86	9	59
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	704	1483	1105	196	26	172
Arrive On Green	0.07	1.00	1.00	1.00	0.13	0.13
Sat Flow, veh/h	1781	1870	1547	274	210	1378
Grp Volume(v), veh/h	236	1202	0	571	69	0
Grp Sat Flow(s),veh/h/ln	1781	1870	0	1821	1612	0
Q Serve(g_s), s	0.0	0.0	0.0	0.0	5.5	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	5.5	0.0
Prop In Lane	1.00			0.15	0.13	0.86
Lane Grp Cap(c), veh/h	704	1483	0	1301	201	0
V/C Ratio(X)	0.34	0.81	0.00	0.44	0.34	0.00
Avail Cap(c_a), veh/h	704	1483	0	1301	201	0
HCM Platoon Ratio	2.00	2.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.11	0.11	0.00	0.89	0.32	0.00
Uniform Delay (d), s/veh	6.5	0.0	0.0	0.0	56.0	0.0
Incr Delay (d2), s/veh	0.1	0.6	0.0	1.0	1.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	0.2	0.0	0.3	2.3	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	6.6	0.6	0.0	1.0	57.5	0.0
LnGrp LOS	A	A	A	A	E	A
Approach Vol, veh/h		1438	571		69	
Approach Delay, s/veh		1.6	1.0		57.5	
Approach LOS		A	A		E	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	11.0	106.0			117.0	23.0
Change Period (Y+Rc), s	6.0	6.0			6.0	5.5
Max Green Setting (Gmax), s	5.0	100.0			111.0	17.5
Max Q Clear Time (g_c+I1), s	2.0	2.0			2.0	7.5
Green Ext Time (p_c), s	0.2	4.1			17.2	0.1
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			3.2			
HCM 6th LOS			A			

# Queues

## 117: Channelside Dr & Nebraska Ave

01/19/2022



Lane Group	EBL	EBT	WBT	SBL
Lane Group Flow (vph)	236	1202	571	68
v/c Ratio	0.38	0.81	0.44	0.27
Control Delay	1.1	5.1	9.2	21.7
Queue Delay	5.3	30.7	0.7	0.1
Total Delay	6.4	35.8	9.8	21.8
Queue Length 50th (ft)	6	174	144	10
Queue Length 95th (ft)	m6	m174	211	m21
Internal Link Dist (ft)		131	222	457
Turn Bay Length (ft)	80			
Base Capacity (vph)	621	1477	1308	255
Starvation Cap Reductn	317	339	397	0
Spillback Cap Reductn	0	60	310	9
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.78	1.06	0.63	0.28

### Intersection Summary

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

HCM 6th Signalized Intersection Summary  
 119: Old Water St & Channelside Dr

01/19/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗		↖	↗	
Traffic Volume (veh/h)	24	1052	38	10	364	122	101	12	70	44	5	60
Future Volume (veh/h)	24	1052	38	10	364	122	101	12	70	44	5	60
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	26	1143	41	11	396	133	110	13	76	48	5	65
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	649	1237	44	607	1086	365	192	34	201	176	17	216
Arrive On Green	0.07	1.00	1.00	0.31	1.00	1.00	0.14	0.14	0.14	0.14	0.14	0.14
Sat Flow, veh/h	1781	1794	64	1781	1339	450	1331	237	1384	1308	114	1488
Grp Volume(v), veh/h	26	0	1184	11	0	529	110	0	89	48	0	70
Grp Sat Flow(s),veh/h/ln	1781	0	1859	1781	0	1789	1331	0	1621	1308	0	1603
Q Serve(g_s), s	0.7	0.0	0.0	0.0	0.0	0.0	11.3	0.0	7.0	4.8	0.0	5.5
Cycle Q Clear(g_c), s	0.7	0.0	0.0	0.0	0.0	0.0	16.7	0.0	7.0	11.8	0.0	5.5
Prop In Lane	1.00		0.03	1.00		0.25	1.00		0.85	1.00		0.93
Lane Grp Cap(c), veh/h	649	0	1281	607	0	1451	192	0	235	176	0	232
V/C Ratio(X)	0.04	0.00	0.92	0.02	0.00	0.36	0.57	0.00	0.38	0.27	0.00	0.30
Avail Cap(c_a), veh/h	649	0	1281	607	0	1451	192	0	235	176	0	232
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.53	0.00	0.53	0.76	0.00	0.76	1.00	0.00	1.00	0.82	0.00	0.82
Uniform Delay (d), s/veh	7.9	0.0	0.0	3.7	0.0	0.0	61.0	0.0	54.1	59.5	0.0	53.5
Incr Delay (d2), s/veh	0.1	0.0	7.4	0.0	0.0	0.5	11.8	0.0	4.6	3.1	0.0	2.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	2.6	0.1	0.0	0.2	4.5	0.0	3.2	1.8	0.0	2.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.9	0.0	7.4	3.7	0.0	0.5	72.8	0.0	58.7	62.6	0.0	56.2
LnGrp LOS	A	A	A	A	A	A	E	A	E	E	A	E
Approach Vol, veh/h		1210			540			199				118
Approach Delay, s/veh		7.5			0.6			66.5				58.8
Approach LOS		A			A			E				E
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.0	120.5		26.0	28.5	103.0		26.0				
Change Period (Y+Rc), s	6.0	6.5		* 5.7	6.5	* 6.5		* 5.7				
Max Green Setting (Gmax), s	5.0	96.5		* 20	5.0	* 97		* 20				
Max Q Clear Time (g_c+I1), s	2.7	2.0		18.7	2.0	2.0		13.8				
Green Ext Time (p_c), s	0.0	4.2		0.2	0.0	19.0		0.3				

Intersection Summary

HCM 6th Ctrl Delay	14.3
HCM 6th LOS	B

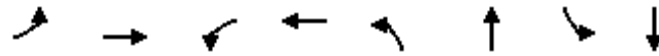
Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Queues

119: Old Water St & Channelside Dr

01/19/2022



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	26	1184	11	529	110	89	48	70
v/c Ratio	0.05	0.93	0.07	0.43	0.58	0.30	0.26	0.24
Control Delay	6.0	15.7	13.4	15.2	68.8	17.4	65.9	23.0
Queue Delay	0.0	16.7	0.0	1.5	0.3	0.0	0.0	0.0
Total Delay	6.0	32.4	13.4	16.7	69.2	17.5	65.9	23.0
Queue Length 50th (ft)	4	173	5	264	95	10	36	10
Queue Length 95th (ft)	m7	#1285	m8	m334	161	62	m60	m32
Internal Link Dist (ft)		222		393		1129		462
Turn Bay Length (ft)	80		100				150	
Base Capacity (vph)	525	1278	149	1243	191	300	184	288
Starvation Cap Reductn	0	12	0	504	0	0	0	0
Spillback Cap Reductn	0	123	0	32	5	4	0	9
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	1.03	0.07	0.72	0.59	0.30	0.26	0.25

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

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

HCM Signalized Intersection Capacity Analysis  
 118: Beneficial Dr/Meridian Ave & Channelside Dr

01/19/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	600	545	21	95	209	59	183	327	76	105	245	104
Future Volume (vph)	600	545	21	95	209	59	183	327	76	105	245	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.2		6.2	6.2		6.4	6.4	6.4	6.4	6.4	6.4
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1852		1770	1801		1770	1863	1583	1770	1863	1583
Flt Permitted	0.33	1.00		0.43	1.00		0.31	1.00	1.00	0.46	1.00	1.00
Satd. Flow (perm)	616	1852		804	1801		579	1863	1583	864	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	652	592	23	103	227	64	199	355	83	114	266	113
RTOR Reduction (vph)	0	1	0	0	7	0	0	0	57	0	0	87
Lane Group Flow (vph)	652	614	0	103	284	0	199	355	26	114	266	26
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	1	6			2		7	4			8	
Permitted Phases	6			2			4		4	8		8
Actuated Green, G (s)	82.8	82.8		38.8	38.8		44.6	44.6	44.6	32.6	32.6	32.6
Effective Green, g (s)	82.8	82.8		38.8	38.8		44.6	44.6	44.6	32.6	32.6	32.6
Actuated g/C Ratio	0.59	0.59		0.28	0.28		0.32	0.32	0.32	0.23	0.23	0.23
Clearance Time (s)	6.0	6.2		6.2	6.2		6.4	6.4	6.4	6.4	6.4	6.4
Vehicle Extension (s)	2.0	3.0		3.0	3.0		2.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	677	1095		222	499		232	593	504	201	433	368
v/s Ratio Prot	c0.26	0.33			0.16		c0.03	0.19			0.14	
v/s Ratio Perm	c0.31			0.13			c0.24		0.02	0.13		0.02
v/c Ratio	0.96	0.56		0.46	0.57		0.86	0.60	0.05	0.57	0.61	0.07
Uniform Delay, d1	23.4	17.5		42.0	43.4		47.3	40.2	33.1	47.5	48.1	41.9
Progression Factor	0.93	0.36		1.00	1.00		1.00	1.00	1.00	1.12	1.12	4.28
Incremental Delay, d2	16.5	1.0		6.8	4.6		31.4	4.4	0.2	10.8	6.2	0.4
Delay (s)	38.2	7.3		48.8	48.1		78.7	44.6	33.3	63.7	59.9	179.7
Level of Service	D	A		D	D		E	D	C	E	E	F
Approach Delay (s)		23.2			48.3			53.8			88.2	
Approach LOS		C			D			D			F	

Intersection Summary

HCM 2000 Control Delay	45.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	94.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Queues

118: Beneficial Dr/Meridian Ave & Channelside Dr

01/19/2022



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	652	615	103	291	199	355	83	114	266	113
v/c Ratio	0.96	0.56	0.46	0.58	0.86	0.60	0.15	0.57	0.61	0.24
Control Delay	37.0	7.5	50.0	47.3	73.4	45.2	7.3	65.3	60.6	26.7
Queue Delay	15.4	3.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.4	10.5	50.0	47.9	73.4	45.2	7.3	65.3	60.6	26.7
Queue Length 50th (ft)	329	156	78	221	139	272	0	103	243	48
Queue Length 95th (ft)	m#508	m191	141	320	#268	380	39	172	341	97
Internal Link Dist (ft)		393		142		1114			460	
Turn Bay Length (ft)	150		150		300			200		
Base Capacity (vph)	678	1096	223	506	232	593	560	201	433	462
Starvation Cap Reductn	44	363	0	0	0	0	0	0	0	0
Spillback Cap Reductn	17	0	0	48	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.03	0.84	0.46	0.64	0.86	0.60	0.15	0.57	0.61	0.24

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

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

# HCS7 Two-Way Stop-Control Report

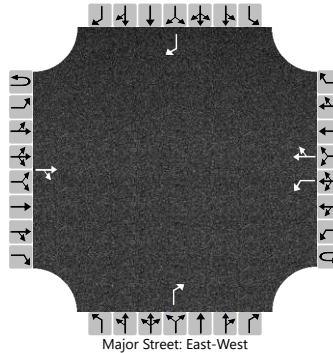
## General Information

Analyst	H.W. Lochner
Agency/Co.	
Date Performed	09/24/2021
Analysis Year	2026
Time Analyzed	PM Peak Hour
Intersection Orientation	East-West
Project Description	Whiting PD&E Study

## Site Information

Intersection	ChannelsideDr&12thSt
Jurisdiction	FDOT, District 7
East/West Street	Channelside Dr
North/South Street	12th St
Peak Hour Factor	0.95
Analysis Time Period (hrs)	1.00

## Lanes



## Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	1	0	0	1	1	0		0	0	1		0	0	1
Configuration				TR		L		TR				R				R
Volume (veh/h)			646	81		6	280	24				85				83
Percent Heavy Vehicles (%)						2						2				2
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized										No				No		
Median Type   Storage	Undivided															

## Critical and Follow-up Headways

Base Critical Headway (sec)					4.1							6.2				6.2
Critical Headway (sec)					4.12							6.22				6.22
Base Follow-Up Headway (sec)					2.2							3.3				3.3
Follow-Up Headway (sec)					2.22							3.32				3.32

## Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)					6							89				87			
Capacity, c (veh/h)					848							426				733			
v/c Ratio					0.01							0.21				0.12			
95% Queue Length, Q <sub>95</sub> (veh)					0.0							0.8				0.4			
Control Delay (s/veh)					9.3							15.7				10.6			
Level of Service (LOS)					A							C				B			
Approach Delay (s/veh)					0.2						15.7					10.6			
Approach LOS					C						C					B			



# MOVEMENT SUMMARY

**Site: 8 [Channelside Drive at Cumberland Avenue\_Build2026-PM (Site Folder: General)]**

Build 2026 Year -  
 PM Peak Hour  
 Site Category: (None)  
 Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
		[ Total veh/h ]	[ HV % ]	[ Total veh/h ]	[ HV % ]				[ Veh. veh ]	[ Dist ft ]				
South: Channelside Drive														
3	L2	123	2.0	129	2.0	0.600	9.9	LOS A	4.6	116.1	0.40	0.23	0.40	35.3
8	T1	581	2.0	612	2.0	0.600	9.9	LOS A	4.6	116.1	0.40	0.23	0.40	36.0
18	R2	25	2.0	26	2.0	0.600	9.9	LOS A	4.6	116.1	0.40	0.23	0.40	34.9
Approach		729	2.0	767	2.0	0.600	9.9	LOS A	4.6	116.1	0.40	0.23	0.40	35.9
East: E Cumberland Avenue														
1	L2	31	2.0	33	2.0	0.090	6.1	LOS A	0.3	7.8	0.56	0.55	0.56	37.2
6	T1	5	2.0	5	2.0	0.090	6.1	LOS A	0.3	7.8	0.56	0.55	0.56	34.7
16	R2	24	2.0	25	2.0	0.090	6.1	LOS A	0.3	7.8	0.56	0.55	0.56	34.5
Approach		60	2.0	63	2.0	0.090	6.1	LOS A	0.3	7.8	0.56	0.55	0.56	35.9
North: Channelside Drive														
7	L2	25	2.0	26	2.0	0.265	5.4	LOS A	1.2	30.2	0.32	0.20	0.32	37.8
4	T1	278	2.0	293	2.0	0.265	5.4	LOS A	1.2	30.2	0.32	0.20	0.32	39.6
14	R2	282	2.0	297	2.0	0.262	5.6	LOS A	1.2	30.5	0.34	0.22	0.34	34.1
Approach		585	2.0	616	2.0	0.265	5.5	LOS A	1.2	30.5	0.33	0.21	0.33	36.7
West: E Cumberland Avenue														
5	L2	46	2.0	48	2.0	0.090	4.3	LOS A	0.3	8.4	0.40	0.30	0.40	34.7
2	T1	22	2.0	23	2.0	0.090	4.3	LOS A	0.3	8.4	0.40	0.30	0.40	34.5
12	R2	20	2.0	21	2.0	0.090	4.3	LOS A	0.3	8.4	0.40	0.30	0.40	33.4
Approach		88	2.0	93	2.0	0.090	4.3	LOS A	0.3	8.4	0.40	0.30	0.40	34.4
All Vehicles		1462	2.0	1539	2.0	0.600	7.7	LOS A	4.6	116.1	0.38	0.24	0.38	36.1

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

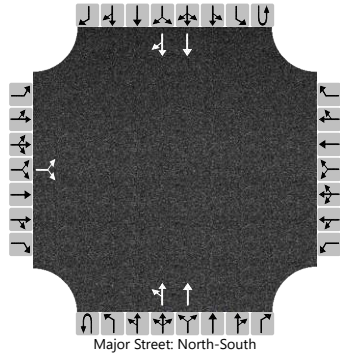
Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	H.W. Lochner			Intersection	ChannelsideDr&E WhitingSt		
Agency/Co.				Jurisdiction	FDOT, District 7		
Date Performed	09/24/2021			East/West Street	E Whiting St		
Analysis Year	2026			North/South Street	Channelside Dr		
Time Analyzed	PM Peak Hour			Peak Hour Factor	0.95		
Intersection Orientation	North-South			Analysis Time Period (hrs)	1.00		
Project Description	Whiting PD&E Study						

## Lanes



## Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound				
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Movement																	
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6	
Number of Lanes		0	1	0		0	0	0	0	0	2	0	0	0	2	0	
Configuration			LR							LT	T				T	TR	
Volume (veh/h)		6		1						1	650				583	20	
Percent Heavy Vehicles (%)		2		2						2							
Proportion Time Blocked																	
Percent Grade (%)		0															
Right Turn Channelized																	
Median Type   Storage		Undivided															

## Critical and Follow-up Headways

Base Critical Headway (sec)		7.5		6.9						4.1							
Critical Headway (sec)		6.84		6.94						4.14							
Base Follow-Up Headway (sec)		3.5		3.3						2.2							
Follow-Up Headway (sec)		3.52		3.32						2.22							

## Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			7							1							
Capacity, c (veh/h)			276							944							
v/c Ratio			0.03							0.00							
95% Queue Length, Q <sub>95</sub> (veh)			0.1							0.0							
Control Delay (s/veh)			18.4							8.8							
Level of Service (LOS)			C							A							
Approach Delay (s/veh)		18.4								0.0							
Approach LOS		C															

HCM Signalized Intersection Capacity Analysis  
 130: Channelside Dr & E Washington St/E York St

01/19/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕↔		↕	↕↔	
Traffic Volume (vph)	20	8	5	16	11	88	5	651	2	30	576	16
Future Volume (vph)	20	8	5	16	11	88	5	651	2	30	576	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.9			8.4	8.4	6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frt		0.98			1.00	0.85	1.00	1.00		1.00	1.00	
Flt Protected		0.97			0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1774			1810	1583	1770	3538		1770	3525	
Flt Permitted		0.22			0.80	1.00	0.41	1.00		0.95	1.00	
Satd. Flow (perm)		395			1488	1583	759	3538		1770	3525	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	9	5	17	12	96	5	708	2	33	626	17
RTOR Reduction (vph)	0	4	0	0	0	90	0	0	0	0	1	0
Lane Group Flow (vph)	0	32	0	0	29	6	5	710	0	33	642	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Prot	NA	
Protected Phases		4			3			2		1	1	2
Permitted Phases	4			3		3	2					
Actuated Green, G (s)		14.9			9.1	9.1	74.9	74.9		14.8	95.7	
Effective Green, g (s)		14.9			9.1	9.1	74.9	74.9		14.8	95.7	
Actuated g/C Ratio		0.11			0.06	0.06	0.54	0.54		0.11	0.68	
Clearance Time (s)		5.9			8.4	8.4	6.0	6.0		6.0		
Vehicle Extension (s)		2.0			4.0	4.0	3.0	3.0		2.0		
Lane Grp Cap (vph)		42			96	102	406	1892		187	2409	
v/s Ratio Prot								c0.20		0.02	c0.18	
v/s Ratio Perm		c0.08			c0.02	0.00	0.01					
v/c Ratio		0.75			0.30	0.06	0.01	0.38		0.18	0.27	
Uniform Delay, d1		60.7			62.4	61.4	15.2	18.9		57.0	8.6	
Progression Factor		1.08			1.00	1.00	1.00	1.00		1.01	1.51	
Incremental Delay, d2		45.9			2.4	0.3	0.1	0.6		0.1	0.0	
Delay (s)		111.5			64.8	61.8	15.3	19.5		57.9	12.9	
Level of Service		F			E	E	B	B		E	B	
Approach Delay (s)		111.5			62.5			19.5			15.1	
Approach LOS		F			E			B			B	

Intersection Summary

HCM 2000 Control Delay	23.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.3
Intersection Capacity Utilization	44.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Queues

130: Channelside Dr & E Washington St/E York St

01/19/2022



Lane Group	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	36	29	96	5	710	33	643
v/c Ratio	0.73	0.30	0.45	0.01	0.37	0.18	0.26
Control Delay	117.7	69.6	13.2	22.2	21.9	57.6	14.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	117.7	69.6	13.2	22.2	21.9	57.6	14.9
Queue Length 50th (ft)	31	26	0	2	202	32	111
Queue Length 95th (ft)	m#76	59	38	12	297	m62	185
Internal Link Dist (ft)	927	832			494		591
Turn Bay Length (ft)			430	160		280	
Base Capacity (vph)	69	229	342	412	1921	190	2415
Starvation Cap Reductn	0	0	0	0	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	0.52	0.13	0.28	0.01	0.37	0.17	0.27

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

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

HCM Signalized Intersection Capacity Analysis  
 129: Channelside Dr & Kennedy Blvd

01/19/2022

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	803	8	38	15	24	47	45	710	4	12	550	441
Future Volume (vph)	803	8	38	15	24	47	45	710	4	12	550	441
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.3	6.3	6.3		6.8	6.8	6.3	6.3		6.3	6.3	6.3
Lane Util. Factor	0.95	0.95	1.00		1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85		1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.95	1.00		0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1687	1583		1828	1583	1770	3536		1770	3539	1583
Flt Permitted	0.95	0.95	1.00		0.68	1.00	0.29	1.00		0.18	1.00	1.00
Satd. Flow (perm)	1681	1687	1583		1268	1583	544	3536		340	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	873	9	41	16	26	51	49	772	4	13	598	479
RTOR Reduction (vph)	0	0	25	0	0	48	0	0	0	0	0	327
Lane Group Flow (vph)	436	446	16	0	42	3	49	776	0	13	598	152
Turn Type	Split	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	3	3			1			2			2	
Permitted Phases			3	1		1	2			2		2
Actuated Green, G (s)	54.7	54.7	54.7		8.7	8.7	44.4	44.4		44.4	44.4	44.4
Effective Green, g (s)	54.7	54.7	54.7		8.7	8.7	44.4	44.4		44.4	44.4	44.4
Actuated g/C Ratio	0.39	0.39	0.39		0.06	0.06	0.32	0.32		0.32	0.32	0.32
Clearance Time (s)	6.3	6.3	6.3		6.8	6.8	6.3	6.3		6.3	6.3	6.3
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	656	659	618		78	98	172	1121		107	1122	502
v/s Ratio Prot	0.26	c0.26						c0.22				0.17
v/s Ratio Perm			0.01		c0.03	0.00	0.09			0.04		0.10
v/c Ratio	0.66	0.68	0.03		0.54	0.03	0.28	0.69		0.12	0.53	0.30
Uniform Delay, d1	35.1	35.3	26.3		63.7	61.7	35.9	41.8		33.9	39.3	36.1
Progression Factor	1.00	1.00	1.00		1.00	1.00	0.44	0.59		1.00	1.00	1.00
Incremental Delay, d2	5.3	5.5	0.1		7.0	0.1	3.9	3.3		2.3	1.8	1.5
Delay (s)	40.4	40.8	26.3		70.7	61.8	19.8	27.9		36.3	41.1	37.7
Level of Service	D	D	C		E	E	B	C		D	D	D
Approach Delay (s)		40.0			65.8			27.5			39.5	
Approach LOS		D			E			C			D	

Intersection Summary

HCM 2000 Control Delay	37.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	22.4
Intersection Capacity Utilization	77.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Queues

129: Channelside Dr & Kennedy Blvd

01/19/2022



Lane Group	EBL	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	436	446	41	42	51	49	776	13	598	479
v/c Ratio	0.66	0.68	0.06	0.47	0.25	0.28	0.67	0.12	0.52	0.57
Control Delay	41.1	41.6	0.2	78.7	3.0	19.8	27.1	36.7	40.2	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.1	41.6	0.2	78.7	3.0	19.8	27.1	36.7	40.2	5.8
Queue Length 50th (ft)	341	351	0	38	0	34	323	8	232	0
Queue Length 95th (ft)	472	486	0	77	2	m72	398	27	292	83
Internal Link Dist (ft)		906		876			591		1242	
Turn Bay Length (ft)			140			280		75		375
Base Capacity (vph)	656	658	680	137	259	177	1154	110	1155	839
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.66	0.68	0.06	0.31	0.20	0.28	0.67	0.12	0.52	0.57

Intersection Summary

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

# HCM Signalized Intersection Capacity Analysis

## 113: Florida Ave & Selmon Expy Off-Ramp

01/19/2022



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↑↑↑	↑↑			
Traffic Volume (vph)	0	445	1360	0	0	0
Future Volume (vph)	0	445	1360	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.6	6.0			
Lane Util. Factor		0.76	0.95			
Frt		0.85	1.00			
Flt Protected		1.00	1.00			
Satd. Flow (prot)		3610	3539			
Flt Permitted		1.00	1.00			
Satd. Flow (perm)		3610	3539			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	484	1478	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	484	1478	0	0	0
Turn Type		Prot	NA			
Protected Phases		2	1 4			
Permitted Phases						
Actuated Green, G (s)		32.4	95.0			
Effective Green, g (s)		32.4	95.0			
Actuated g/C Ratio		0.23	0.68			
Clearance Time (s)		6.6				
Vehicle Extension (s)		3.0				
Lane Grp Cap (vph)		835	2401			
v/s Ratio Prot		c0.13	c0.42			
v/s Ratio Perm						
v/c Ratio		0.58	0.62			
Uniform Delay, d1		47.8	12.4			
Progression Factor		1.00	0.33			
Incremental Delay, d2		2.9	0.2			
Delay (s)		50.7	4.3			
Level of Service		D	A			
Approach Delay (s)	50.7		4.3		0.0	
Approach LOS	D		A		A	

### Intersection Summary

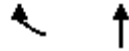
HCM 2000 Control Delay	15.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	91.3%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

## Queues

### 113: Florida Ave & Selmon Expy Off-Ramp

01/19/2022



Lane Group	WBR	NBT
Lane Group Flow (vph)	484	1478
v/c Ratio	0.58	0.62
Control Delay	51.0	4.7
Queue Delay	0.0	0.0
Total Delay	51.0	4.7
Queue Length 50th (ft)	172	67
Queue Length 95th (ft)	223	m74
Internal Link Dist (ft)		1
Turn Bay Length (ft)	350	
Base Capacity (vph)	835	2401
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.58	0.62

#### Intersection Summary

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



# HCM Signalized Intersection Capacity Analysis

109: Florida Ave & Brorein St

01/19/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↑↑↑		↖	↑↑↑				
Traffic Volume (vph)	0	0	0	0	1730	22	196	1660	0	0	0	0
Future Volume (vph)	0	0	0	0	1730	22	196	1660	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					5.8		6.1	6.1				
Lane Util. Factor					0.86		1.00	0.91				
Fr <sub>t</sub>					1.00		1.00	1.00				
Fl <sub>t</sub> Protected					1.00		0.95	1.00				
Satd. Flow (prot)					6396		1770	5085				
Fl <sub>t</sub> Permitted					1.00		0.95	1.00				
Satd. Flow (perm)					6396		1770	5085				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	1880	24	213	1804	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	1	0	22	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	1903	0	191	1804	0	0	0	0
Turn Type					NA		Perm	NA				
Protected Phases					2			4				
Permitted Phases							4					
Actuated Green, G (s)					54.2		73.9	73.9				
Effective Green, g (s)					54.2		73.9	73.9				
Actuated g/C Ratio					0.37		0.51	0.51				
Clearance Time (s)					5.8		6.1	6.1				
Vehicle Extension (s)					3.0		3.0	3.0				
Lane Grp Cap (vph)					2390		902	2591				
v/s Ratio Prot					c0.30			c0.35				
v/s Ratio Perm							0.11					
v/c Ratio					0.80		0.21	0.70				
Uniform Delay, d <sub>1</sub>					40.5		19.5	27.0				
Progression Factor					1.00		1.00	1.00				
Incremental Delay, d <sub>2</sub>					2.9		0.5	1.6				
Delay (s)					43.3		20.1	28.6				
Level of Service					D		C	C				
Approach Delay (s)		0.0			43.3			27.7			0.0	
Approach LOS		A			D			C			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			35.3		HCM 2000 Level of Service					D		
HCM 2000 Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			145.0		Sum of lost time (s)					14.9		
Intersection Capacity Utilization			67.4%		ICU Level of Service					C		
Analysis Period (min)			15									

c Critical Lane Group

# Queues

## 109: Florida Ave & Brorein St

01/19/2022



Lane Group	WBT	NBL	NBT
Lane Group Flow (vph)	1904	213	1804
v/c Ratio	0.80	0.23	0.70
Control Delay	43.5	16.2	28.8
Queue Delay	0.0	0.0	47.9
Total Delay	43.5	16.2	76.8
Queue Length 50th (ft)	463	85	462
Queue Length 95th (ft)	510	137	517
Internal Link Dist (ft)	416		356
Turn Bay Length (ft)		300	
Base Capacity (vph)	2391	923	2591
Starvation Cap Reductn	0	0	973
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.80	0.23	1.11
<b>Intersection Summary</b>			

HCM Signalized Intersection Capacity Analysis  
 110: Morgan St & Brorein St & Selmon Expy Off-Ramp

01/19/2022



Movement	WBL	WBT	NBL	NBT	NBR2	SBL	SBT	SBR	SWR	SWR2
Lane Configurations		↕↕	↙	↕	↙	↙	↘		↙	↙
Traffic Volume (vph)	3	1238	454	464	361	445	20	521	471	96
Future Volume (vph)	3	1238	454	464	361	445	20	521	471	96
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.7	5.5	6.0	6.0	5.5	6.0		5.7	5.7
Lane Util. Factor		0.95	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt		1.00	1.00	1.00	0.85	1.00	0.86		1.00	0.85
Flt Protected		1.00	0.95	1.00	1.00	0.95	1.00		1.00	1.00
Satd. Flow (prot)		3539	1770	1863	1583	1770	1594		1863	1583
Flt Permitted		1.00	0.21	1.00	1.00	0.36	1.00		1.00	1.00
Satd. Flow (perm)		3539	393	1863	1583	679	1594		1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	3	1346	493	504	392	484	22	566	512	104
RTOR Reduction (vph)	0	0	0	0	32	0	3	0	0	70
Lane Group Flow (vph)	0	1349	493	504	360	484	585	0	512	34
Turn Type	Perm	NA	pm+pt	NA	Perm	pm+pt	NA		Prot	Perm
Protected Phases		2!	7	4		3	8		2!	
Permitted Phases	2		4		4	8				2
Actuated Green, G (s)		46.3	82.0	70.0	70.0	70.5	64.0		46.3	46.3
Effective Green, g (s)		46.3	82.0	70.0	70.0	70.5	64.0		46.3	46.3
Actuated g/C Ratio		0.33	0.59	0.50	0.50	0.50	0.46		0.33	0.33
Clearance Time (s)		5.7	5.5	6.0	6.0	5.5	6.0		5.7	5.7
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		1170	353	931	791	392	728		616	523
v/s Ratio Prot			c0.12	0.27		0.06	0.37		0.27	
v/s Ratio Perm		0.38	c0.69		0.23	0.56				0.02
v/c Ratio		1.15	1.40	0.54	0.46	1.23	0.80		0.83	0.07
Uniform Delay, d1		46.9	26.9	24.0	22.7	36.6	32.6		43.2	32.1
Progression Factor		0.68	1.08	0.97	0.95	1.04	1.04		1.00	1.00
Incremental Delay, d2		69.9	192.3	1.9	1.6	124.9	8.7		12.4	0.2
Delay (s)		101.7	221.3	25.2	23.0	162.9	42.5		55.6	32.3
Level of Service		F	F	C	C	F	D		E	C
Approach Delay (s)		101.7		94.2			96.9			
Approach LOS		F		F			F			

Intersection Summary

HCM 2000 Control Delay	91.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.34		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	17.2
Intersection Capacity Utilization	141.0%	ICU Level of Service	H
Analysis Period (min)	15		

! Phase conflict between lane groups.

c Critical Lane Group

Queues

110: Morgan St & Brorein St & Selmon Expy Off-Ramp

01/19/2022



Lane Group	WBT	NBL	NBT	NBR2	SBL	SBT	SWR	SWR2
Lane Group Flow (vph)	1349	493	504	392	484	588	512	104
v/c Ratio	1.15	1.39	0.54	0.48	1.23	0.80	0.83	0.17
Control Delay	100.8	211.9	25.7	19.8	149.3	43.2	56.3	5.8
Queue Delay	0.5	0.0	4.6	1.7	0.4	7.8	0.0	0.0
Total Delay	101.3	211.9	30.3	21.4	149.7	50.9	56.3	5.8
Queue Length 50th (ft)	~776	~470	344	203	~416	484	430	0
Queue Length 95th (ft)	m563	#786	473	344	#685	641	#610	39
Internal Link Dist (ft)	494		424			563		
Turn Bay Length (ft)		250		10			300	300
Base Capacity (vph)	1170	354	931	823	395	731	616	596
Starvation Cap Reductn	132	0	346	265	0	110	0	0
Spillback Cap Reductn	0	0	0	36	15	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.30	1.39	0.86	0.70	1.27	0.95	0.83	0.17

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

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

# HCM 6th Signalized Intersection Summary

111: Jefferson St & Brorein St

01/19/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↕		↖	↕		↖	↗	↖
Traffic Volume (veh/h)	383	535	27	3	843	746	206	240	359	158	105	192
Future Volume (veh/h)	383	535	27	3	843	746	206	240	359	158	105	192
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	416	582	29	3	916	811	224	261	390	172	114	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	325	963	48	312	656	532	434	473	422	193	525	
Arrive On Green	0.15	0.55	0.55	0.47	0.47	0.47	0.05	0.27	0.27	0.02	0.09	0.00
Sat Flow, veh/h	1781	1766	88	810	1863	1512	1781	1777	1585	1781	1870	1585
Grp Volume(v), veh/h	416	0	611	3	870	857	224	261	390	172	114	0
Grp Sat Flow(s),veh/h/ln	1781	0	1855	810	1777	1598	1781	1777	1585	1781	1870	1585
Q Serve(g_s), s	21.5	0.0	31.3	0.3	49.3	49.3	7.5	17.7	33.5	9.5	7.9	0.0
Cycle Q Clear(g_c), s	21.5	0.0	31.3	4.6	49.3	49.3	7.5	17.7	33.5	9.5	7.9	0.0
Prop In Lane	1.00		0.05	1.00		0.95	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	325	0	1011	312	626	563	434	473	422	193	525	
V/C Ratio(X)	1.28	0.00	0.60	0.01	1.39	1.52	0.52	0.55	0.92	0.89	0.22	
Avail Cap(c_a), veh/h	325	0	1011	312	626	563	434	473	422	193	525	
HCM Platoon Ratio	1.00	1.00	1.00	1.33	1.33	1.33	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	0.33	0.00	0.33	0.86	0.86	0.86	0.98	0.98	0.98	1.00	1.00	0.00
Uniform Delay (d), s/veh	46.9	0.0	21.6	26.6	37.2	37.2	39.8	44.2	50.0	41.6	49.3	0.0
Incr Delay (d2), s/veh	133.9	0.0	0.9	0.0	183.9	243.2	4.3	4.5	27.9	41.0	0.9	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	23.6	0.0	13.7	0.1	51.8	55.8	3.4	8.4	16.5	6.8	4.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	180.8	0.0	22.5	26.6	221.2	280.4	44.1	48.6	77.8	82.6	50.2	0.0
LnGrp LOS	F	A	C	C	F	F	D	D	E	F	D	
Approach Vol, veh/h		1027			1730			875			286	A
Approach Delay, s/veh		86.6			250.2			60.5			69.7	
Approach LOS		F			F			E			E	
Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	27.0	55.0	15.0	43.0		82.0	13.0	45.0				
Change Period (Y+Rc), s	5.5	* 5.7	5.5	* 5.7		* 5.7	5.5	* 5.7				
Max Green Setting (Gmax), s	21.5	* 49	9.5	* 37		* 76	7.5	* 39				
Max Q Clear Time (g_c+I1), s	23.5	51.3	11.5	35.5		33.3	9.5	9.9				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.6		4.8	0.0	0.6				

## Intersection Summary

HCM 6th Ctrl Delay	151.8
HCM 6th LOS	F

## Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Queues

111: Jefferson St & Brorein St

01/19/2022



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	416	611	3	1727	224	651	172	114	209
v/c Ratio	1.28	0.61	0.01	1.36	0.51	0.62	0.78	0.22	0.35
Control Delay	172.3	11.5	23.7	191.5	37.2	26.6	48.2	37.9	7.7
Queue Delay	0.0	1.6	0.0	1.8	0.5	5.6	62.4	0.0	0.1
Total Delay	172.3	13.1	23.7	193.2	37.7	32.2	110.6	37.9	7.7
Queue Length 50th (ft)	~425	347	2	~567	139	156	112	85	36
Queue Length 95th (ft)	m#458	m272	m2	m#991	208	225	m#179	m118	m58
Internal Link Dist (ft)		494		148		443		116	
Turn Bay Length (ft)	150		50		100		50		
Base Capacity (vph)	325	1009	284	1272	436	1051	221	522	594
Starvation Cap Reductn	0	230	0	8	0	0	0	0	0
Spillback Cap Reductn	0	144	0	403	44	334	71	0	38
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.28	0.78	0.01	1.99	0.57	0.91	1.15	0.22	0.38

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary  
 112: Nebraska Ave & Brorein St

01/19/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	52	734	266	54	989	77	212	77	180	22	10	391
Future Volume (veh/h)	52	734	266	54	989	77	212	77	180	22	10	391
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	57	798	289	59	1075	84	230	84	196	24	11	425
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	374	873	316	397	2225	174	89	19	44	41	18	397
Arrive On Green	1.00	1.00	1.00	1.00	1.00	1.00	0.25	0.25	0.25	0.25	0.25	0.25
Sat Flow, veh/h	485	1310	475	519	3339	261	207	75	176	57	73	1573
Grp Volume(v), veh/h	57	0	1087	59	572	587	510	0	0	460	0	0
Grp Sat Flow(s),veh/h/ln	485	0	1785	519	1777	1823	458	0	0	1703	0	0
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	35.3	0.0	0.0	35.3	0.0	0.0
Prop In Lane	1.00		0.27	1.00		0.14	0.45		0.38	0.05		0.92
Lane Grp Cap(c), veh/h	374	0	1190	397	1184	1215	153	0	0	456	0	0
V/C Ratio(X)	0.15	0.00	0.91	0.15	0.48	0.48	3.34	0.00	0.00	1.01	0.00	0.00
Avail Cap(c_a), veh/h	374	0	1190	397	1184	1215	153	0	0	456	0	0
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.72	0.00	0.72	0.09	0.09	0.09	0.93	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	56.7	0.0	0.0	53.8	0.0	0.0
Incr Delay (d2), s/veh	0.6	0.0	9.3	0.1	0.1	0.1	1066.9	0.0	0.0	44.1	0.0	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	3.1	0.0	0.0	0.0	50.8	0.0	0.0	22.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.6	0.0	9.3	0.1	0.1	0.1	1123.5	0.0	0.0	97.9	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	F	A	A	F	A	A
Approach Vol, veh/h		1144			1218			510				460
Approach Delay, s/veh		8.9			0.1			1123.5				97.9
Approach LOS		A			A			F				F
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		99.0		41.0		99.0		41.0				
Change Period (Y+Rc), s		* 5.7		* 5.7		* 5.7		* 5.7				
Max Green Setting (Gmax), s		* 93		* 35		* 93		* 35				
Max Q Clear Time (g_c+I1), s		2.0		37.3		2.0		37.3				
Green Ext Time (p_c), s		12.4		0.0		17.4		0.0				

Intersection Summary

HCM 6th Ctrl Delay	188.6
HCM 6th LOS	F

Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Queues

112: Nebraska Ave & Brorein St

01/19/2022



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	57	1087	59	1159	510	460
v/c Ratio	0.23	0.91	0.57	0.50	3.38	0.94
Control Delay	13.6	35.5	25.3	15.3	1102.3	64.7
Queue Delay	1.3	24.1	0.0	4.4	20.7	51.6
Total Delay	14.8	59.7	25.3	19.7	1123.1	116.3
Queue Length 50th (ft)	17	902	29	337	~802	313
Queue Length 95th (ft)	m37	#1192	m39	m291	#924	#531
Internal Link Dist (ft)		148		203	457	414
Turn Bay Length (ft)	50		70			
Base Capacity (vph)	244	1200	103	2336	151	490
Starvation Cap Reductn	87	113	0	1082	0	0
Spillback Cap Reductn	0	158	0	304	87	262
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.36	1.04	0.57	0.92	7.97	2.02

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.



# HCM 6th Signalized Intersection Summary

701: Water St

01/19/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↕		↖	↗		↖	↗	
Traffic Volume (veh/h)	121	728	88	32	440	13	461	110	49	8	35	219
Future Volume (veh/h)	121	728	88	32	440	13	461	110	49	8	35	219
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	132	791	96	35	478	14	501	120	53	9	38	238
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	676	1132	137	484	2440	71	141	338	149	168	42	262
Arrive On Green	1.00	1.00	1.00	1.00	1.00	1.00	0.02	0.09	0.09	0.19	0.19	0.19
Sat Flow, veh/h	905	1636	199	627	3526	103	1781	1230	543	1212	223	1396
Grp Volume(v), veh/h	132	0	887	35	241	251	501	0	173	9	0	276
Grp Sat Flow(s),veh/h/ln	905	0	1835	627	1777	1852	1781	0	1773	1212	0	1619
Q Serve(g_s), s	0.1	0.0	0.0	0.0	0.0	0.0	6.5	0.0	12.8	0.9	0.0	23.4
Cycle Q Clear(g_c), s	0.3	0.0	0.0	0.2	0.0	0.0	6.5	0.0	12.8	13.8	0.0	23.4
Prop In Lane	1.00		0.11	1.00		0.06	1.00		0.31	1.00		0.86
Lane Grp Cap(c), veh/h	676	0	1270	484	1230	1282	141	0	487	168	0	304
V/C Ratio(X)	0.20	0.00	0.70	0.07	0.20	0.20	3.54	0.00	0.35	0.05	0.00	0.91
Avail Cap(c_a), veh/h	676	0	1270	484	1230	1282	141	0	487	168	0	304
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	0.30	0.00	0.30	0.82	0.82	0.82	0.98	0.00	0.98	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	67.6	0.0	52.0	57.6	0.0	55.7
Incr Delay (d2), s/veh	0.2	0.0	1.0	0.2	0.3	0.3	1160.5	0.0	2.0	0.6	0.0	32.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.3	0.0	0.1	0.1	50.9	0.0	6.4	0.3	0.0	12.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.2	0.0	1.0	0.2	0.3	0.3	1228.0	0.0	54.0	58.2	0.0	88.2
LnGrp LOS	A	A	A	A	A	A	F	A	D	E	A	F
Approach Vol, veh/h		1019			527			674				285
Approach Delay, s/veh		0.9			0.3			926.7				87.3
Approach LOS		A			A			F				F
Timer - Assigned Phs		2		4		6	7	8				
Phs Duration (G+Y+Rc), s		102.8		44.2		102.8	12.2	32.0				
Change Period (Y+Rc), s		* 5.7		* 5.7		* 5.7	* 5.7	* 5.7				
Max Green Setting (Gmax), s		* 90		* 38		* 90	* 6.5	* 26				
Max Q Clear Time (g_c+I1), s		2.2		14.8		2.3	8.5	25.4				
Green Ext Time (p_c), s		3.7		1.0		10.7	0.0	0.2				

## Intersection Summary

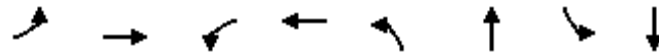
HCM 6th Ctrl Delay	259.7
HCM 6th LOS	F

## Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Queues  
701: Water St

01/19/2022



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	132	887	35	492	501	173	9	276
v/c Ratio	0.24	0.75	0.17	0.22	2.32	0.35	0.05	0.59
Control Delay	7.0	10.9	3.3	1.8	633.5	41.3	47.8	21.0
Queue Delay	1.4	38.1	0.0	0.0	11.4	0.0	0.0	0.9
Total Delay	8.4	49.0	3.3	1.8	644.9	41.3	47.8	21.9
Queue Length 50th (ft)	31	359	2	11	~752	123	7	61
Queue Length 95th (ft)	m31	m313	m3	16	#954	196	24	160
Internal Link Dist (ft)		203		452		462		361
Turn Bay Length (ft)	70		70		150		150	
Base Capacity (vph)	550	1185	212	2275	216	497	182	465
Starvation Cap Reductn	268	356	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	178	101	0	0	51
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	1.07	0.17	0.23	4.36	0.35	0.05	0.67

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary  
 120: Meridian Ave & Cumberland Ave

01/19/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗			↖	↗	↖	↗		↖	↗	↖
Traffic Volume (veh/h)	542	134	108	1	462	91	25	841	119	160	345	7
Future Volume (veh/h)	542	134	108	1	462	91	25	841	119	160	345	7
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	589	146	117	1	502	0	27	914	129	174	375	8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	346	452	362	26	879		438	1108	156	160	1259	562
Arrive On Green	0.78	0.78	0.78	0.47	0.47	0.00	0.01	0.12	0.12	0.08	0.71	0.71
Sat Flow, veh/h	896	961	770	0	1870	1585	1781	3127	441	1781	3554	1585
Grp Volume(v), veh/h	589	0	263	503	0	0	27	519	524	174	375	8
Grp Sat Flow(s),veh/h/ln	896	0	1732	1870	0	1585	1781	1777	1791	1781	1777	1585
Q Serve(g_s), s	38.5	0.0	6.1	0.0	0.0	0.0	1.3	40.0	40.0	5.6	5.5	0.2
Cycle Q Clear(g_c), s	65.8	0.0	6.1	27.3	0.0	0.0	1.3	40.0	40.0	5.6	5.5	0.2
Prop In Lane	1.00		0.44	0.00		1.00	1.00		0.25	1.00		1.00
Lane Grp Cap(c), veh/h	346	0	814	905	0		438	630	635	160	1259	562
V/C Ratio(X)	1.70	0.00	0.32	0.56	0.00		0.06	0.83	0.83	1.09	0.30	0.01
Avail Cap(c_a), veh/h	346	0	814	905	0		438	630	635	160	1259	562
HCM Platoon Ratio	1.67	1.67	1.67	1.00	1.00	1.00	0.33	0.33	0.33	2.00	2.00	2.00
Upstream Filter(l)	0.59	0.00	0.59	1.00	0.00	0.00	0.44	0.44	0.44	0.98	0.98	0.98
Uniform Delay (d), s/veh	27.0	0.0	8.6	26.9	0.0	0.0	26.9	57.6	57.6	44.8	14.0	13.2
Incr Delay (d2), s/veh	322.5	0.0	0.6	2.5	0.0	0.0	0.1	5.5	5.5	96.3	0.6	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	42.8	0.0	2.2	13.0	0.0	0.0	0.6	20.1	20.2	7.2	2.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	349.4	0.0	9.3	29.4	0.0	0.0	27.0	63.1	63.1	141.1	14.6	13.2
LnGrp LOS	F	A	A	C	A		C	E	E	F	B	B
Approach Vol, veh/h		852			503	A		1070				557
Approach Delay, s/veh		244.4			29.4			62.2				54.1
Approach LOS		F			C			E				D
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	12.0	56.0		72.0	12.0	56.0		72.0				
Change Period (Y+Rc), s	6.4	6.4		* 6.2	6.4	6.4		* 6.2				
Max Green Setting (Gmax), s	5.6	49.6		* 66	5.6	49.6		* 66				
Max Q Clear Time (g_c+I1), s	3.3	7.5		67.8	7.6	42.0		29.3				
Green Ext Time (p_c), s	0.0	2.5		0.0	0.0	3.7		3.9				

Intersection Summary

HCM 6th Ctrl Delay	107.2
HCM 6th LOS	F

Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.  
 Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Queues

120: Meridian Ave & Cumberland Ave

01/19/2022















Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	589	263	503	99	27	1043	174	375	8
v/c Ratio	2.14	0.31	0.57	0.13	0.07	0.84	1.34	0.30	0.01
Control Delay	541.7	10.7	30.2	7.0	20.0	43.4	221.9	27.2	0.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	20.5	0.0	0.0	0.0
Total Delay	541.7	10.7	30.2	7.0	20.0	63.9	221.9	27.2	0.7
Queue Length 50th (ft)	~607	41	326	11	11	471	~152	109	0
Queue Length 95th (ft)	#843	m74	441	44	m15	m297	#261	148	m0
Internal Link Dist (ft)		452	888			460		712	
Turn Bay Length (ft)	100			100	200		250		
Base Capacity (vph)	275	837	875	784	386	1237	130	1253	609
Starvation Cap Reductn	0	0	0	0	0	221	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	2.14	0.31	0.57	0.13	0.07	1.03	1.34	0.30	0.01

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis  
 102: Florida Ave & Whiting St

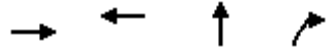
01/19/2022

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↔↔			↔↔			↔↔↔	↔				
Traffic Volume (vph)	180	454	0	0	293	263	120	2092	129	0	0	0	
Future Volume (vph)	180	454	0	0	293	263	120	2092	129	0	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		6.0			6.0			5.7	5.7				
Lane Util. Factor		0.95			0.95			0.91	1.00				
Frt		1.00			0.93			1.00	0.85				
Flt Protected		0.99			1.00			1.00	1.00				
Satd. Flow (prot)		3490			3288			5072	1583				
Flt Permitted		0.59			1.00			1.00	1.00				
Satd. Flow (perm)		2078			3288			5072	1583				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	196	493	0	0	318	286	130	2274	140	0	0	0	
RTOR Reduction (vph)	0	0	0	0	29	0	0	0	21	0	0	0	
Lane Group Flow (vph)	0	689	0	0	575	0	0	2404	119	0	0	0	
Turn Type	Perm	NA			NA		Perm	NA	Perm				
Protected Phases		4			4			2					
Permitted Phases	4						2		2				
Actuated Green, G (s)		49.0			49.0			74.3	74.3				
Effective Green, g (s)		49.0			49.0			74.3	74.3				
Actuated g/C Ratio		0.35			0.35			0.53	0.53				
Clearance Time (s)		6.0			6.0			5.7	5.7				
Vehicle Extension (s)		3.0			3.0			3.0	3.0				
Lane Grp Cap (vph)		727			1150			2691	840				
v/s Ratio Prot					0.17								
v/s Ratio Perm		c0.33						0.47	0.08				
v/c Ratio		0.98dl			0.50			0.89	0.14				
Uniform Delay, d1		44.3			35.8			29.3	16.7				
Progression Factor		1.00			0.71			1.00	1.00				
Incremental Delay, d2		22.8			1.2			5.1	0.4				
Delay (s)		67.1			26.7			34.4	17.0				
Level of Service		E			C			C	B				
Approach Delay (s)		67.1			26.7			33.4			0.0		
Approach LOS		E			C			C			A		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			38.4									HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio			0.89										
Actuated Cycle Length (s)			140.0									Sum of lost time (s)	13.7
Intersection Capacity Utilization			91.9%									ICU Level of Service	F
Analysis Period (min)			15										
dl Defacto Left Lane. Recode with 1 though lane as a left lane.													
c Critical Lane Group													

# Queues

## 102: Florida Ave & Whiting St

01/19/2022



Lane Group	EBT	WBT	NBT	NBR
Lane Group Flow (vph)	689	604	2404	140
v/c Ratio	0.98dl	0.51	0.89	0.16
Control Delay	67.2	25.0	34.8	11.9
Queue Delay	0.0	0.0	45.2	0.0
Total Delay	67.2	25.0	79.9	11.9
Queue Length 50th (ft)	320	136	694	42
Queue Length 95th (ft)	#451	190	768	80
Internal Link Dist (ft)	821	519	567	
Turn Bay Length (ft)				100
Base Capacity (vph)	727	1180	2690	860
Starvation Cap Reductn	0	0	501	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.95	0.51	1.10	0.16

### Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

HCM Signalized Intersection Capacity Analysis  
 103: Morgan St & Whiting St

01/19/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	138	397	173	103	348	163	136	466	97	39	416	54
Future Volume (vph)	138	397	173	103	348	163	136	466	97	39	416	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.8	5.8		5.8	5.8			5.7			5.7	
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	
Frt	1.00	0.95		1.00	0.95			0.98			0.98	
Flt Protected	0.95	1.00		0.95	1.00			0.99			1.00	
Satd. Flow (prot)	1770	1778		1770	1774			3432			3469	
Flt Permitted	0.26	1.00		0.20	1.00			0.67			0.81	
Satd. Flow (perm)	479	1778		376	1774			2325			2818	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	150	432	188	112	378	177	148	507	105	42	452	59
RTOR Reduction (vph)	0	11	0	0	12	0	0	9	0	0	6	0
Lane Group Flow (vph)	150	609	0	112	543	0	0	751	0	0	547	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Actuated Green, G (s)	64.2	64.2		64.2	64.2			64.3			64.3	
Effective Green, g (s)	64.2	64.2		64.2	64.2			64.3			64.3	
Actuated g/C Ratio	0.46	0.46		0.46	0.46			0.46			0.46	
Clearance Time (s)	5.8	5.8		5.8	5.8			5.7			5.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	219	815		172	813			1067			1294	
v/s Ratio Prot		c0.34			0.31							
v/s Ratio Perm	0.31			0.30				c0.32			0.19	
v/c Ratio	0.68	0.75		0.65	0.67			0.70			0.42	
Uniform Delay, d1	29.9	31.2		29.3	29.6			30.2			25.4	
Progression Factor	0.53	0.50		0.92	0.92			0.84			1.00	
Incremental Delay, d2	12.6	4.8		16.0	3.9			3.7			1.0	
Delay (s)	28.4	20.3		42.9	31.3			29.2			26.4	
Level of Service	C	C		D	C			C			C	
Approach Delay (s)		21.9			33.2			29.2			26.4	
Approach LOS		C			C			C			C	

Intersection Summary

HCM 2000 Control Delay	27.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	11.5
Intersection Capacity Utilization	93.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

# Queues

## 103: Morgan St & Whiting St

01/19/2022



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	150	620	112	555	760	553
v/c Ratio	0.68	0.75	0.65	0.67	0.71	0.43
Control Delay	30.2	20.1	45.8	30.8	29.0	26.1
Queue Delay	0.0	1.3	0.0	2.5	0.0	0.1
Total Delay	30.2	21.4	45.8	33.3	29.0	26.2
Queue Length 50th (ft)	44	171	66	317	161	171
Queue Length 95th (ft)	m62	m222	m#154	459	254	221
Internal Link Dist (ft)		519		503	563	436
Turn Bay Length (ft)			150			
Base Capacity (vph)	219	827	172	824	1077	1300
Starvation Cap Reductn	0	75	0	158	0	0
Spillback Cap Reductn	0	0	0	0	0	105
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.82	0.65	0.83	0.71	0.46

### Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.

















Queue shown is maximum after two cycles.

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



HCM Signalized Intersection Capacity Analysis  
 104: Jefferson St & Whiting St

01/19/2022

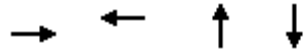
														
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations														
Traffic Volume (vph)	85	294	358	36	260	200	166	363	27	176	398	42		
Future Volume (vph)	85	294	358	36	260	200	166	363	27	176	398	42		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900		
Total Lost time (s)		6.1			6.1			6.1			6.0			
Lane Util. Factor		0.95			0.95			0.95			0.95			
Frt		0.93			0.94			0.99			0.99			
Flt Protected		0.99			1.00			0.99			0.99			
Satd. Flow (prot)		3263			3313			3462			3454			
Flt Permitted		0.70			0.72			0.58			0.61			
Satd. Flow (perm)		2293			2406			2038			2126			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92		
Adj. Flow (vph)	92	320	389	39	283	217	180	395	29	191	433	46		
RTOR Reduction (vph)	0	145	0	0	86	0	0	3	0	0	3	0		
Lane Group Flow (vph)	0	656	0	0	453	0	0	601	0	0	667	0		
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		Perm	NA			
Protected Phases	3	8			4			6			2			
Permitted Phases	8			4			6			2				
Actuated Green, G (s)		48.4			48.4			59.9			60.0			
Effective Green, g (s)		48.4			48.4			59.9			60.0			
Actuated g/C Ratio		0.35			0.35			0.43			0.43			
Clearance Time (s)		6.1			6.1			6.1			6.0			
Vehicle Extension (s)		3.0			3.0			3.0			3.0			
Lane Grp Cap (vph)		792			831			871			911			
v/s Ratio Prot														
v/s Ratio Perm		c0.29			0.19			0.29			c0.31			
v/c Ratio		0.83			0.54			0.69			0.73			
Uniform Delay, d1		42.0			36.9			32.5			33.3			
Progression Factor		1.15			1.11			0.54			1.00			
Incremental Delay, d2		6.2			0.7			0.2			5.2			
Delay (s)		54.4			41.7			17.6			38.5			
Level of Service		D			D			B			D			
Approach Delay (s)		54.4			41.7			17.6			38.5			
Approach LOS		D			D			B			D			
<b>Intersection Summary</b>														
HCM 2000 Control Delay			39.2									HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio			0.74											
Actuated Cycle Length (s)			140.0								25.9			
Intersection Capacity Utilization			90.2%										ICU Level of Service	E
Analysis Period (min)			15											

c Critical Lane Group

Queues

104: Jefferson St & Whiting St

01/19/2022



Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	801	539	604	670
v/c Ratio	0.85	0.59	0.69	0.73
Control Delay	42.3	32.3	18.0	38.8
Queue Delay	0.0	0.0	0.1	0.1
Total Delay	42.3	32.3	18.1	38.9
Queue Length 50th (ft)	312	92	177	262
Queue Length 95th (ft)	370	115	m129	341
Internal Link Dist (ft)	503	427	450	207
Turn Bay Length (ft)				
Base Capacity (vph)	1152	1010	874	915
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	14	15
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.70	0.53	0.70	0.74

Intersection Summary

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

# HCM Signalized Intersection Capacity Analysis

## 715: Selmon Expy Off-Ramp & Whiting St

01/19/2022



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↵	↵↵
Traffic Volume (vph)	487	0	0	420	89	325
Future Volume (vph)	487	0	0	420	89	325
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.7			5.7	6.0	6.0
Lane Util. Factor	0.95			0.95	1.00	0.88
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3539			3539	1770	2787
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3539			3539	1770	2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	529	0	0	457	97	353
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	529	0	0	457	97	353
Turn Type	NA			NA	Prot	custom
Protected Phases	5			2	4	4 6
Permitted Phases						
Actuated Green, G (s)	28.1			84.3	44.0	100.2
Effective Green, g (s)	28.1			84.3	44.0	94.5
Actuated g/C Ratio	0.20			0.60	0.31	0.68
Clearance Time (s)	5.7			5.7	6.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	710			2130	556	1881
v/s Ratio Prot	c0.15			c0.13	0.05	c0.13
v/s Ratio Perm						
v/c Ratio	0.75			0.21	0.17	0.19
Uniform Delay, d1	52.6			12.7	34.8	8.5
Progression Factor	0.73			1.11	1.00	1.00
Incremental Delay, d2	3.0			0.2	0.7	0.2
Delay (s)	41.6			14.3	35.5	8.7
Level of Service	D			B	D	A
Approach Delay (s)	41.6			14.3	14.5	
Approach LOS	D			B	B	

### Intersection Summary

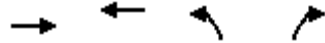
HCM 2000 Control Delay	24.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	17.4
Intersection Capacity Utilization	34.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

# Queues

## 715: Selmon Expy Off-Ramp & Whiting St

01/19/2022



Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	529	457	97	353
v/c Ratio	0.75	0.21	0.17	0.18
Control Delay	43.1	14.4	35.9	7.3
Queue Delay	0.0	0.8	0.0	0.0
Total Delay	43.1	15.1	35.9	7.3
Queue Length 50th (ft)	213	145	64	53
Queue Length 95th (ft)	265	m163	111	88
Internal Link Dist (ft)	427	276	783	
Turn Bay Length (ft)			350	350
Base Capacity (vph)	1625	2130	556	1994
Starvation Cap Reductn	0	1312	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.33	0.56	0.17	0.18

### Intersection Summary

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

HCM 6th Signalized Intersection Summary  
 11: Water St/Brush St & Whiting St

01/19/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗		↖	↗			↕	
Traffic Volume (veh/h)	135	554	123	230	173	3	188	239	48	98	86	59
Future Volume (veh/h)	135	554	123	230	173	3	188	239	48	98	86	59
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	147	602	134	250	188	3	204	260	52	107	93	64
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	798	1947	928	501	2052	33	265	382	76	91	57	36
Arrive On Green	0.04	0.37	0.37	0.08	0.57	0.57	0.04	0.25	0.25	0.17	0.17	0.17
Sat Flow, veh/h	1781	3554	1585	1781	3580	57	1781	1513	303	314	326	205
Grp Volume(v), veh/h	147	602	134	250	93	98	204	0	312	264	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1860	1781	0	1816	845	0	0
Q Serve(g_s), s	5.0	16.9	7.3	8.5	3.3	3.3	5.3	0.0	21.7	13.6	0.0	0.0
Cycle Q Clear(g_c), s	5.0	16.9	7.3	8.5	3.3	3.3	5.3	0.0	21.7	24.3	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.03	1.00		0.17	0.41		0.24
Lane Grp Cap(c), veh/h	798	1947	928	501	1019	1066	265	0	458	183	0	0
V/C Ratio(X)	0.18	0.31	0.14	0.50	0.09	0.09	0.77	0.00	0.68	1.44	0.00	0.00
Avail Cap(c_a), veh/h	1141	1947	928	658	1019	1066	265	0	458	183	0	0
HCM Platoon Ratio	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.84	0.84	0.84	0.97	0.97	0.97	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	12.4	25.4	18.9	12.9	13.5	13.5	51.1	0.0	47.3	63.4	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.3	0.3	0.7	0.2	0.2	13.0	0.0	4.1	227.9	0.0	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	7.8	2.9	3.5	1.4	1.5	5.4	0.0	10.5	18.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.5	25.7	19.2	13.6	13.6	13.6	64.1	0.0	51.4	291.3	0.0	0.0
LnGrp LOS	B	C	B	B	B	B	E	A	D	F	A	A
Approach Vol, veh/h		883			441			516			264	
Approach Delay, s/veh		22.5			13.6			56.4			291.3	
Approach LOS		C			B			E			F	
Timer - Assigned Phs	1	2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.0	86.0		41.0	16.6	82.4	11.0	30.0				
Change Period (Y+Rc), s	* 5.7	* 5.7		* 5.7	5.5	* 5.7	* 5.7	* 5.7				
Max Green Setting (Gmax), s	* 34	* 53		* 35	23.5	* 64	* 5.3	* 24				
Max Q Clear Time (g_c+I1), s	7.0	5.3		23.7	10.5	18.9	7.3	26.3				
Green Ext Time (p_c), s	0.4	1.2		1.5	0.6	5.3	0.0	0.0				

Intersection Summary

HCM 6th Ctrl Delay	62.7
HCM 6th LOS	E

Notes

User approved pedestrian interval to be less than phase max green.  
 \* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Queues

11: Water St/Brush St & Whiting St

01/21/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	147	602	134	250	191	204	312	264
v/c Ratio	0.20	0.32	0.13	0.46	0.10	0.84	0.67	1.41
Control Delay	6.0	15.3	4.2	17.0	19.7	75.6	54.4	253.6
Queue Delay	0.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.0	16.8	4.2	17.0	19.7	75.6	54.4	253.6
Queue Length 50th (ft)	18	220	36	110	48	158	252	~316
Queue Length 95th (ft)	34	267	72	165	78	#290	360	#500
Internal Link Dist (ft)		276			426		126	215
Turn Bay Length (ft)	100		200	300		50		
Base Capacity (vph)	929	1885	1019	633	1964	244	463	187
Starvation Cap Reductn	0	1043	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.71	0.13	0.39	0.10	0.84	0.67	1.41

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

# HCM Signalized Intersection Capacity Analysis

## 7: Meridian Ave & Whiting St

01/19/2022



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	336	364	71	1386	248	335
Future Volume (vph)	336	364	71	1386	248	335
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	6.9	6.4	6.6	4.0
Lane Util. Factor	0.97	1.00	1.00	0.91	0.86	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3433	1583	1770	5085	6408	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3433	1583	1770	5085	6408	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	365	396	77	1507	270	364
RTOR Reduction (vph)	0	290	0	0	0	0
Lane Group Flow (vph)	365	106	77	1507	270	364
Turn Type	Prot	Perm	Prot	NA	NA	Free
Protected Phases	7 8		1	6	2	
Permitted Phases		7 8				Free
Actuated Green, G (s)	37.4	37.4	12.2	88.5	69.2	140.0
Effective Green, g (s)	37.4	37.4	12.2	88.5	69.2	140.0
Actuated g/C Ratio	0.27	0.27	0.09	0.63	0.49	1.00
Clearance Time (s)			6.9	6.4	6.6	
Vehicle Extension (s)			3.0	3.0	3.0	
Lane Grp Cap (vph)	917	422	154	3214	3167	1583
v/s Ratio Prot	c0.11		0.04	c0.30	0.04	
v/s Ratio Perm		0.07				0.23
v/c Ratio	0.40	0.25	0.50	0.47	0.09	0.23
Uniform Delay, d1	42.1	40.3	61.0	13.5	18.7	0.0
Progression Factor	0.47	1.26	1.21	0.22	1.00	1.00
Incremental Delay, d2	0.3	0.3	2.3	0.4	0.1	0.3
Delay (s)	19.9	50.9	76.0	3.4	18.7	0.3
Level of Service	B	D	E	A	B	A
Approach Delay (s)	36.0			6.9	8.2	
Approach LOS	D			A	A	

### Intersection Summary

HCM 2000 Control Delay	14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.7
Intersection Capacity Utilization	46.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Queues

7: Meridian Ave & Whiting St

01/21/2022



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	365	396	77	1507	270	364
v/c Ratio	0.38	0.54	0.50	0.47	0.09	0.23
Control Delay	19.4	6.5	82.5	3.6	20.6	0.3
Queue Delay	0.0	0.2	0.0	0.0	0.0	0.0
Total Delay	19.4	6.7	82.5	3.6	20.6	0.3
Queue Length 50th (ft)	97	213	63	47	36	0
Queue Length 95th (ft)	m61	m15	101	64	61	0
Internal Link Dist (ft)	426			229	186	
Turn Bay Length (ft)	200	250	150			
Base Capacity (vph)	1554	933	355	3213	3167	1583
Starvation Cap Reductn	0	119	0	284	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.49	0.22	0.51	0.09	0.23

Intersection Summary

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



HCM Signalized Intersection Capacity Analysis  
 107: Meridian Ave & Whiting St

01/19/2022



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	47	88	1370	104	147	465
Future Volume (vph)	47	88	1370	104	147	465
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.7		6.4		5.5	6.9
Lane Util. Factor	1.00		0.91		1.00	0.91
Frt	0.91		0.99		1.00	1.00
Flt Protected	0.98		1.00		0.95	1.00
Satd. Flow (prot)	1670		5031		1770	5085
Flt Permitted	0.98		1.00		0.11	1.00
Satd. Flow (perm)	1670		5031		209	5085
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	51	96	1489	113	160	505
RTOR Reduction (vph)	60	0	4	0	0	0
Lane Group Flow (vph)	87	0	1598	0	160	505
Turn Type	Prot		NA		custom	NA
Protected Phases	8		6		7	1 2 7
Permitted Phases					1 2	
Actuated Green, G (s)	13.7		88.5		106.5	113.1
Effective Green, g (s)	13.7		88.5		99.6	106.5
Actuated g/C Ratio	0.10		0.63		0.71	0.76
Clearance Time (s)	7.7		6.4		5.5	
Vehicle Extension (s)	3.0		3.0		3.0	
Lane Grp Cap (vph)	163		3180		351	3868
v/s Ratio Prot	c0.05		c0.32		c0.06	0.10
v/s Ratio Perm					0.26	
v/c Ratio	0.53		0.50		0.46	0.13
Uniform Delay, d1	60.1		13.9		25.9	4.4
Progression Factor	1.06		0.67		1.01	1.43
Incremental Delay, d2	3.3		0.1		0.9	0.0
Delay (s)	66.9		9.4		27.1	6.4
Level of Service	E		A		C	A
Approach Delay (s)	66.9		9.4			11.4
Approach LOS	E		A			B

Intersection Summary			
HCM 2000 Control Delay	13.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.7
Intersection Capacity Utilization	61.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

# Queues

## 107: Meridian Ave & Whiting St

01/19/2022



Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	147	1602	160	505
v/c Ratio	0.66	0.50	0.44	0.12
Control Delay	47.5	9.9	21.7	5.2
Queue Delay	0.0	0.0	0.1	0.2
Total Delay	47.5	9.9	21.8	5.4
Queue Length 50th (ft)	72	174	28	36
Queue Length 95th (ft)	141	m221	82	63
Internal Link Dist (ft)	878	712		229
Turn Bay Length (ft)				
Base Capacity (vph)	505	3182	367	4067
Starvation Cap Reductn	0	0	10	2609
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.29	0.50	0.45	0.35

### Intersection Summary

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

# HCS7 Two-Way Stop-Control Report

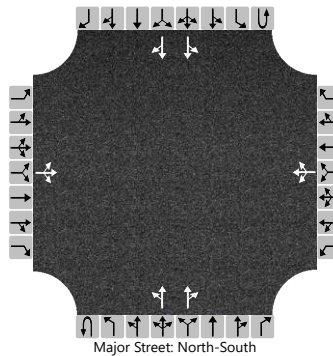
## General Information

Analyst	H.W. Lochner
Agency/Co.	
Date Performed	09/24/2021
Analysis Year	2026
Time Analyzed	PM Peak Hour
Intersection Orientation	North-South
Project Description	Whiting PD&E Study

## Site Information

Intersection	EWashingtonST&JeffersonSt
Jurisdiction	FDOT, District 7
East/West Street	E Washington St
North/South Street	Jefferson St
Peak Hour Factor	0.95
Analysis Time Period (hrs)	1.00

## Lanes



## Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound				
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Movement																	
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6	
Number of Lanes		0	1	0		0	1	0		0	2	0		0	2	0	
Configuration			LTR				LTR			LT		TR		LT		TR	
Volume (veh/h)		22	102	85		94	49	94		99	502	47		115	437	38	
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2			
Proportion Time Blocked																	
Percent Grade (%)		0				0											
Right Turn Channelized																	
Median Type   Storage		Undivided															

## Critical and Follow-up Headways

Base Critical Headway (sec)		7.5	6.5	6.9		7.5	6.5	6.9		4.1				4.1		
Critical Headway (sec)		7.54	6.54	6.94		7.54	6.54	6.94		4.14				4.14		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.52	4.02	3.32		3.52	4.02	3.32		2.22				2.22		

## Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			220				249				104				121					
Capacity, c (veh/h)			118								1060				992					
v/c Ratio			1.86								0.10				0.12					
95% Queue Length, Q <sub>95</sub> (veh)			56.8								0.3				0.4					
Control Delay (s/veh)			1654.5								8.8				9.1					
Level of Service (LOS)			F								A				A					
Approach Delay (s/veh)		1654.5										1.7					2.2			
Approach LOS		F																		

# HCS7 Two-Way Stop-Control Report

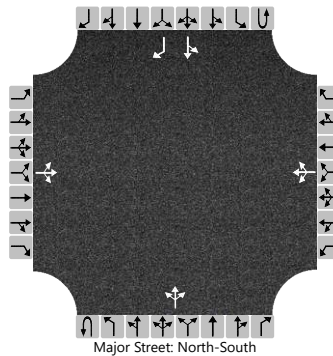
## General Information

Analyst	H.W. Lochner
Agency/Co.	
Date Performed	09/24/2021
Analysis Year	2026
Time Analyzed	PM Peak Hour
Intersection Orientation	North-South
Project Description	Whiting PD&E Study

## Site Information

Intersection	EWashingtonSt&BrushSt
Jurisdiction	FDOT, District 7
East/West Street	E Washington St
North/South Street	Brush St
Peak Hour Factor	0.95
Analysis Time Period (hrs)	1.00

## Lanes



## Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound				
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Movement																	
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6	
Number of Lanes		0	1	0		0	1	0		0	1	0		0	1	1	
Configuration			LTR				LTR				LTR			LT		R	
Volume (veh/h)		108	5	143		11	21	5		82	310	5		5	66	55	
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2			
Proportion Time Blocked																	
Percent Grade (%)		0				0											
Right Turn Channelized																Yes	
Median Type   Storage		Undivided															

## Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.12	6.52	6.22		7.12	6.52	6.22		4.12				4.12		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.52	4.02	3.32		3.52	4.02	3.32		2.22				2.22		

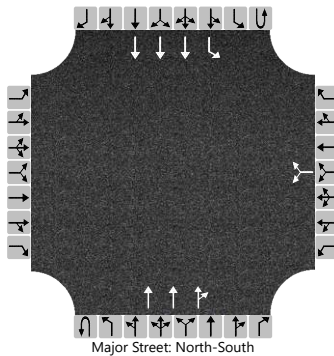
## Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			269				39				86				5		
Capacity, c (veh/h)			574				374				1531				1228		
v/c Ratio			0.47				0.10				0.06				0.00		
95% Queue Length, Q <sub>95</sub> (veh)			2.6				0.3				0.2				0.0		
Control Delay (s/veh)			16.8				15.7				7.5				7.9		
Level of Service (LOS)			C				C				A				A		
Approach Delay (s/veh)		16.8				15.7				2.0				0.3			
Approach LOS		C				C											

# HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	H.W. Lochner	Intersection	MeridianAve&EWashingtonSt
Agency/Co.		Jurisdiction	FDOT, District 7
Date Performed	09/24/2021	East/West Street	Meridian Ave
Analysis Year	2026	North/South Street	E Washington St
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.95
Intersection Orientation	North-South	Analysis Time Period (hrs)	1.00
Project Description	Whiting PD&E Study		

## Lanes



## Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0		0	3	0		0	1	3
Configuration							LR				T	TR		L	T	
Volume (veh/h)						48		80			1518	204		0	5	535
Percent Heavy Vehicles (%)						2		2						0	2	
Proportion Time Blocked																
Percent Grade (%)							0									
Right Turn Channelized																
Median Type   Storage							Left Only									1

## Critical and Follow-up Headways

















Base Critical Headway (sec)						6.4		7.1							5.3	
Critical Headway (sec)						5.74		7.14							5.34	
Base Follow-Up Headway (sec)						3.8		3.9							3.1	
Follow-Up Headway (sec)						3.82		3.92							3.12	

## Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							135								5	
Capacity, c (veh/h)							137								156	
v/c Ratio							0.98								0.03	
95% Queue Length, Q <sub>95</sub> (veh)							13.7								0.1	
Control Delay (s/veh)							232.4								29.0	
Level of Service (LOS)							F								D	
Approach Delay (s/veh)							232.4								0.3	
Approach LOS							F									

HCM Signalized Intersection Capacity Analysis  
 114: Florida Ave & Channelside Dr

01/19/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	927	1328	446	0	0	0	0	251	92	0	0	0
Future Volume (vph)	927	1328	446	0	0	0	0	251	92	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.1						6.0	6.0			
Lane Util. Factor	*0.51	*0.76						*0.80	1.00			
Frt	1.00	0.96						1.00	0.85			
Flt Protected	0.95	1.00						1.00	1.00			
Satd. Flow (prot)	1805	2725						2980	1583			
Flt Permitted	0.95	1.00						1.00	1.00			
Satd. Flow (perm)	1805	2725						2980	1583			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1008	1443	485	0	0	0	0	273	100	0	0	0
RTOR Reduction (vph)	225	16	0	0	0	0	0	0	89	0	0	0
Lane Group Flow (vph)	783	1912	0	0	0	0	0	273	11	0	0	0
Turn Type	Prot	NA						NA	Perm			
Protected Phases	1	6						4				
Permitted Phases									4			
Actuated Green, G (s)	58.0	112.9						15.0	15.0			
Effective Green, g (s)	58.0	112.9						15.0	15.0			
Actuated g/C Ratio	0.41	0.81						0.11	0.11			
Clearance Time (s)	6.0	6.1						6.0	6.0			
Vehicle Extension (s)	3.0	3.0						3.0	3.0			
Lane Grp Cap (vph)	747	2197						319	169			
v/s Ratio Prot	c0.43	c0.70						c0.09				
v/s Ratio Perm									0.01			
v/c Ratio	1.05	0.87						0.86	0.06			
Uniform Delay, d1	41.0	8.8						61.4	56.2			
Progression Factor	1.00	1.00						1.00	1.00			
Incremental Delay, d2	46.3	5.1						19.6	0.2			
Delay (s)	87.3	13.9						81.0	56.3			
Level of Service	F	B						F	E			
Approach Delay (s)		39.1			0.0			74.4			0.0	
Approach LOS		D			A			E			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			43.1					HCM 2000 Level of Service		D		
HCM 2000 Volume to Capacity ratio			0.97									
Actuated Cycle Length (s)			140.0					Sum of lost time (s)		18.6		
Intersection Capacity Utilization			97.7%					ICU Level of Service		F		
Analysis Period (min)			15									

c Critical Lane Group

# Queues

## 114: Florida Ave & Channelside Dr

01/19/2022



Lane Group	EBL	EBT	NBT	NBR
Lane Group Flow (vph)	1008	1928	273	100
v/c Ratio	1.04	0.87	0.86	0.39
Control Delay	64.0	14.2	85.7	15.0
Queue Delay	24.8	0.0	2.1	0.0
Total Delay	88.8	14.2	87.8	15.0
Queue Length 50th (ft)	~752	601	155	0
Queue Length 95th (ft)	#1012	782	#248	56
Internal Link Dist (ft)		1290	1157	
Turn Bay Length (ft)				200
Base Capacity (vph)	972	2212	319	258
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	142	0	10	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.21	0.87	0.88	0.39

### Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis  
 115: Morgan St & Channelside Dr

01/19/2022

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	255	1115	50	154	0	604	0	120	4	13	68	0	
Future Volume (vph)	255	1115	50	154	0	604	0	120	4	13	68	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	5.5	6.2		5.9		5.9		5.9	5.9	5.9	5.9		
Lane Util. Factor	1.00	0.95		1.00		1.00		1.00	1.00	1.00	1.00		
Frt	1.00	0.99		1.00		0.85		1.00	0.85	1.00	1.00		
Flt Protected	0.95	1.00		0.95		1.00		1.00	1.00	0.95	1.00		
Satd. Flow (prot)	1770	3517		1770		1583		1863	1583	1770	1863		
Flt Permitted	0.95	1.00		0.22		1.00		1.00	1.00	0.59	1.00		
Satd. Flow (perm)	1770	3517		409		1583		1863	1583	1092	1863		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	277	1212	54	167	0	657	0	130	4	14	74	0	
RTOR Reduction (vph)	0	2	0	0	0	86	0	0	3	0	0	0	
Lane Group Flow (vph)	277	1264	0	167	0	571	0	130	1	14	74	0	
Turn Type	pm+pt	NA		Perm		Perm		NA	Perm	Perm	NA		
Protected Phases	1	6						4				8	
Permitted Phases	6			2		2			4	8			
Actuated Green, G (s)	103.8	103.8		86.5		86.5		24.1	24.1	24.1	24.1		
Effective Green, g (s)	103.8	103.8		86.5		86.5		24.1	24.1	24.1	24.1		
Actuated g/C Ratio	0.74	0.74		0.62		0.62		0.17	0.17	0.17	0.17		
Clearance Time (s)	5.5	6.2		5.9		5.9		5.9	5.9	5.9	5.9		
Vehicle Extension (s)	3.0	3.0		3.0		3.0		3.0	3.0	3.0	3.0		
Lane Grp Cap (vph)	1312	2607		252		978		320	272	187	320		
v/s Ratio Prot	0.02	c0.36						c0.07			0.04		
v/s Ratio Perm	0.14			c0.41		0.36			0.00	0.01			
v/c Ratio	0.21	0.48		0.66		0.58		0.41	0.00	0.07	0.23		
Uniform Delay, d1	5.5	7.3		17.3		16.0		51.6	48.0	48.6	50.0		
Progression Factor	0.65	0.54		0.91		1.07		1.00	1.00	0.40	0.39		
Incremental Delay, d2	0.0	0.3		6.5		1.2		3.8	0.0	0.7	1.5		
Delay (s)	3.6	4.2		22.3		18.3		55.4	48.0	20.3	21.1		
Level of Service	A	A		C		B		E	D	C	C		
Approach Delay (s)		4.1			19.1			55.2			20.9		
Approach LOS		A			B			E			C		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			12.1									HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.61										
Actuated Cycle Length (s)			140.0									Sum of lost time (s)	17.3
Intersection Capacity Utilization			74.3%									ICU Level of Service	D
Analysis Period (min)			15										

c Critical Lane Group



Queues

115: Morgan St & Channelside Dr

01/19/2022



Lane Group	EBL	EBT	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	277	1266	167	657	130	4	14	74
v/c Ratio	0.21	0.49	0.66	0.62	0.41	0.01	0.07	0.23
Control Delay	3.7	4.3	25.3	12.7	56.0	0.0	20.6	21.3
Queue Delay	0.1	0.5	0.0	4.0	0.0	0.0	0.1	0.0
Total Delay	3.8	4.7	25.3	16.7	56.0	0.0	20.7	21.3
Queue Length 50th (ft)	31	77	57	173	107	0	6	32
Queue Length 95th (ft)	m49	117	m72	m218	174	0	m11	m56
Internal Link Dist (ft)		523			1253			424
Turn Bay Length (ft)	450			10			100	
Base Capacity (vph)	1321	2610	253	1064	320	328	187	320
Starvation Cap Reductn	0	795	0	237	0	0	0	0
Spillback Cap Reductn	354	240	0	317	0	0	31	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.70	0.66	0.88	0.41	0.01	0.09	0.23

Intersection Summary

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

HCM 6th Signalized Intersection Summary  
 116: Channelside Dr & Jefferson St

01/19/2022

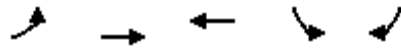


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↶	↷	↶		↷	↷
Traffic Volume (veh/h)	422	710	660	153	6	98
Future Volume (veh/h)	422	710	660	153	6	98
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	459	772	717	166	7	107
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	757	1443	756	175	261	232
Arrive On Green	0.07	0.25	1.00	1.00	0.15	0.15
Sat Flow, veh/h	1781	1870	1469	340	1781	1585
Grp Volume(v), veh/h	459	772	0	883	7	107
Grp Sat Flow(s),veh/h/ln	1781	1870	0	1809	1781	1585
Q Serve(g_s), s	12.0	49.9	0.0	0.0	0.5	8.7
Cycle Q Clear(g_c), s	12.0	49.9	0.0	0.0	0.5	8.7
Prop In Lane	1.00			0.19	1.00	1.00
Lane Grp Cap(c), veh/h	757	1443	0	930	261	232
V/C Ratio(X)	0.61	0.54	0.00	0.95	0.03	0.46
Avail Cap(c_a), veh/h	757	1443	0	930	261	232
HCM Platoon Ratio	0.33	0.33	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.87	0.87	0.00	0.71	0.09	0.09
Uniform Delay (d), s/veh	7.4	30.5	0.0	0.0	51.2	54.7
Incr Delay (d2), s/veh	3.1	1.2	0.0	15.3	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.1	25.6	0.0	4.0	0.2	3.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	10.6	31.8	0.0	15.3	51.2	55.3
LnGrp LOS	B	C	A	B	D	E
Approach Vol, veh/h		1231	883		114	
Approach Delay, s/veh		23.9	15.3		55.0	
Approach LOS		C	B		E	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	36.0	78.0			114.0	26.0
Change Period (Y+Rc), s	6.0	6.0			6.0	5.5
Max Green Setting (Gmax), s	30.0	72.0			108.0	20.5
Max Q Clear Time (g_c+I1), s	14.0	2.0			51.9	10.7
Green Ext Time (p_c), s	1.4	9.4			7.0	0.2
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			22.1			
HCM 6th LOS			C			

# Queues

## 116: Channelside Dr & Jefferson St

01/19/2022



Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	459	772	883	7	107
v/c Ratio	1.06	0.54	0.94	0.03	0.33
Control Delay	99.4	2.3	43.6	45.5	28.9
Queue Delay	16.9	0.1	44.3	0.0	0.0
Total Delay	116.3	2.4	88.0	45.5	28.9
Queue Length 50th (ft)	~398	10	695	7	67
Queue Length 95th (ft)	#620	12	#1026	m8	m56
Internal Link Dist (ft)		315	131	443	
Turn Bay Length (ft)				100	
Base Capacity (vph)	435	1437	939	259	323
Starvation Cap Reductn	25	79	139	0	0
Spillback Cap Reductn	0	87	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.12	0.57	1.10	0.03	0.33

### Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary  
 117: Channelside Dr & Nebraska Ave

01/19/2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	122	594	554	220	29	259
Future Volume (veh/h)	122	594	554	220	29	259
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	133	646	602	239	32	282
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	573	1483	910	361	20	179
Arrive On Green	0.07	1.00	1.00	1.00	0.13	0.13
Sat Flow, veh/h	1781	1870	1274	506	163	1436
Grp Volume(v), veh/h	133	646	0	841	315	0
Grp Sat Flow(s),veh/h/ln	1781	1870	0	1779	1604	0
Q Serve(g_s), s	0.0	0.0	0.0	0.0	17.5	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	17.5	0.0
Prop In Lane	1.00			0.28	0.10	0.90
Lane Grp Cap(c), veh/h	573	1483	0	1271	200	0
V/C Ratio(X)	0.23	0.44	0.00	0.66	1.57	0.00
Avail Cap(c_a), veh/h	573	1483	0	1271	200	0
HCM Platoon Ratio	2.00	2.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.83	0.83	0.00	0.57	0.79	0.00
Uniform Delay (d), s/veh	5.9	0.0	0.0	0.0	61.3	0.0
Incr Delay (d2), s/veh	0.8	0.8	0.0	1.6	275.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.3	0.0	0.6	22.5	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	6.6	0.8	0.0	1.6	336.5	0.0
LnGrp LOS	A	A	A	A	F	A
Approach Vol, veh/h		779	841		315	
Approach Delay, s/veh		1.8	1.6		336.5	
Approach LOS		A	A		F	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	11.0	106.0			117.0	23.0
Change Period (Y+Rc), s	6.0	6.0			6.0	5.5
Max Green Setting (Gmax), s	5.0	100.0			111.0	17.5
Max Q Clear Time (g_c+I1), s	2.0	2.0			2.0	19.5
Green Ext Time (p_c), s	0.1	7.7			4.8	0.0
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			56.2			
HCM 6th LOS			E			

# Queues

## 117: Channelside Dr & Nebraska Ave

01/19/2022



Lane Group	EBL	EBT	WBT	SBL
Lane Group Flow (vph)	133	646	841	314
v/c Ratio	0.32	0.44	0.65	0.73
Control Delay	3.6	3.0	5.1	28.9
Queue Delay	1.1	0.4	4.7	63.1
Total Delay	4.7	3.3	9.8	92.0
Queue Length 50th (ft)	7	146	76	119
Queue Length 95th (ft)	9	137	94	191
Internal Link Dist (ft)		131	222	457
Turn Bay Length (ft)	80			
Base Capacity (vph)	421	1477	1290	430
Starvation Cap Reductn	139	346	163	0
Spillback Cap Reductn	0	0	370	242
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.47	0.57	0.91	1.67

### Intersection Summary

HCM 6th Signalized Intersection Summary  
119: Old Water St & Channelside Dr

01/19/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗		↖	↗	
Traffic Volume (veh/h)	94	505	24	118	736	148	12	43	40	40	10	26
Future Volume (veh/h)	94	505	24	118	736	148	12	43	40	40	10	26
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	102	549	26	128	800	161	13	47	43	43	11	28
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	472	1221	58	825	1225	247	222	130	119	179	68	172
Arrive On Green	0.07	1.00	1.00	0.31	1.00	1.00	0.14	0.14	0.14	0.14	0.14	0.14
Sat Flow, veh/h	1781	1771	84	1781	1511	304	1368	899	823	1307	467	1189
Grp Volume(v), veh/h	102	0	575	128	0	961	13	0	90	43	0	39
Grp Sat Flow(s),veh/h/ln	1781	0	1855	1781	0	1816	1368	0	1722	1307	0	1656
Q Serve(g_s), s	3.0	0.0	0.0	0.0	0.0	0.0	1.2	0.0	6.6	4.3	0.0	2.9
Cycle Q Clear(g_c), s	3.0	0.0	0.0	0.0	0.0	0.0	4.1	0.0	6.6	10.9	0.0	2.9
Prop In Lane	1.00		0.05	1.00		0.17	1.00		0.48	1.00		0.72
Lane Grp Cap(c), veh/h	472	0	1279	825	0	1472	222	0	250	179	0	240
V/C Ratio(X)	0.22	0.00	0.45	0.16	0.00	0.65	0.06	0.00	0.36	0.24	0.00	0.16
Avail Cap(c_a), veh/h	472	0	1279	825	0	1472	222	0	250	179	0	240
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.83	0.00	0.83	0.09	0.00	0.09	1.00	0.00	1.00	0.85	0.00	0.85
Uniform Delay (d), s/veh	8.3	0.0	0.0	4.1	0.0	0.0	54.2	0.0	54.0	58.9	0.0	52.4
Incr Delay (d2), s/veh	0.9	0.0	1.0	0.0	0.0	0.2	0.5	0.0	4.0	2.7	0.0	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	0.3	0.8	0.0	0.1	0.4	0.0	3.2	1.6	0.0	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.1	0.0	1.0	4.1	0.0	0.2	54.7	0.0	58.0	61.6	0.0	53.6
LnGrp LOS	A	A	A	A	A	A	D	A	E	E	A	D
Approach Vol, veh/h		677			1089			103				82
Approach Delay, s/veh		2.2			0.7			57.6				57.8
Approach LOS		A			A			E				E
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.0	120.5		26.0	28.5	103.0		26.0				
Change Period (Y+Rc), s	6.0	6.5		* 5.7	6.5	* 6.5		* 5.7				
Max Green Setting (Gmax), s	5.0	96.5		* 20	5.0	* 97		* 20				
Max Q Clear Time (g_c+I1), s	5.0	2.0		8.6	2.0	2.0		12.9				
Green Ext Time (p_c), s	0.0	11.3		0.5	0.1	4.5		0.2				

Intersection Summary

HCM 6th Ctrl Delay	6.6
HCM 6th LOS	A

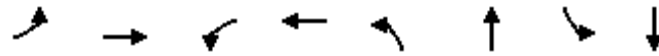
Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Queues

119: Old Water St & Channelside Dr

01/19/2022



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	102	575	128	961	13	90	43	39
v/c Ratio	0.43	0.45	0.22	0.76	0.07	0.33	0.23	0.15
Control Delay	9.6	4.4	12.3	21.9	52.8	40.4	59.9	28.7
Queue Delay	0.0	0.3	0.0	49.8	0.0	0.0	0.0	0.0
Total Delay	9.6	4.8	12.3	71.7	52.8	40.4	59.9	28.7
Queue Length 50th (ft)	8	52	54	557	10	51	0	8
Queue Length 95th (ft)	m15	69	m51	m485	32	106	m74	m41
Internal Link Dist (ft)		222		393		1129		462
Turn Bay Length (ft)	80		100				150	
Base Capacity (vph)	239	1276	594	1257	197	274	183	264
Starvation Cap Reductn	0	254	0	412	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.56	0.22	1.14	0.07	0.33	0.23	0.15

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis  
 118: Beneficial Dr/Meridian Ave & Channelside Dr

01/19/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	245	328	11	97	457	113	157	497	67	111	378	388
Future Volume (vph)	245	328	11	97	457	113	157	497	67	111	378	388
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.2		6.2	6.2		6.4	6.4	6.4	6.4	6.4	6.4
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1854		1770	1807		1770	1863	1583	1770	1863	1583
Flt Permitted	0.09	1.00		0.54	1.00		0.10	1.00	1.00	0.14	1.00	1.00
Satd. Flow (perm)	166	1854		1009	1807		191	1863	1583	267	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	266	357	12	105	497	123	171	540	73	121	411	422
RTOR Reduction (vph)	0	1	0	0	7	0	0	0	49	0	0	291
Lane Group Flow (vph)	266	368	0	105	613	0	171	540	24	121	411	131
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	1	6			2		7	4			8	
Permitted Phases	6			2			4		4	8		8
Actuated Green, G (s)	82.8	82.8		38.8	38.8		44.6	44.6	44.6	32.6	32.6	32.6
Effective Green, g (s)	82.8	82.8		38.8	38.8		44.6	44.6	44.6	32.6	32.6	32.6
Actuated g/C Ratio	0.59	0.59		0.28	0.28		0.32	0.32	0.32	0.23	0.23	0.23
Clearance Time (s)	6.0	6.2		6.2	6.2		6.4	6.4	6.4	6.4	6.4	6.4
Vehicle Extension (s)	2.0	3.0		3.0	3.0		2.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	533	1096		279	500		124	593	504	62	433	368
v/s Ratio Prot	c0.14	0.20			c0.34		0.06	c0.29			0.22	
v/s Ratio Perm	0.16			0.10			0.38		0.02	c0.45		0.08
v/c Ratio	0.50	0.34		0.38	1.23		1.38	0.91	0.05	1.95	0.95	0.36
Uniform Delay, d1	28.8	14.6		40.8	50.6		44.6	45.8	33.0	53.7	52.9	44.9
Progression Factor	0.57	0.45		1.00	1.00		1.00	1.00	1.00	0.37	0.37	1.55
Incremental Delay, d2	3.1	0.8		3.8	118.9		212.9	20.5	0.2	476.1	30.0	2.4
Delay (s)	19.5	7.4		44.7	169.5		257.5	66.3	33.2	496.1	49.4	71.9
Level of Service	B	A		D	F		F	E	C	F	D	E
Approach Delay (s)		12.4			151.4			104.9			116.0	
Approach LOS		B			F			F			F	

Intersection Summary

HCM 2000 Control Delay	100.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.21		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	99.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Queues

118: Beneficial Dr/Meridian Ave & Channelside Dr

01/19/2022



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	266	369	105	620	171	540	73	121	411	422
v/c Ratio	0.50	0.34	0.38	1.22	1.38	0.91	0.13	1.95	0.95	0.64
Control Delay	17.5	7.4	45.6	159.1	245.1	66.6	8.0	496.7	51.9	15.1
Queue Delay	0.4	0.5	0.0	0.0	5.0	0.0	0.0	0.0	0.0	39.1
Total Delay	18.0	7.9	45.6	159.1	250.2	66.6	8.0	496.7	51.9	54.2
Queue Length 50th (ft)	82	86	78	~689	~153	472	1	~169	331	222
Queue Length 95th (ft)	145	113	136	#929	#310	#688	37	m#250	#573	426
Internal Link Dist (ft)		393		142		1114			460	
Turn Bay Length (ft)	150		150		300			200		
Base Capacity (vph)	533	1096	279	507	124	593	553	62	433	659
Starvation Cap Reductn	58	348	0	0	0	0	0	0	0	140
Spillback Cap Reductn	0	0	0	2	25	0	0	0	0	259
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.49	0.38	1.23	1.73	0.91	0.13	1.95	0.95	1.05

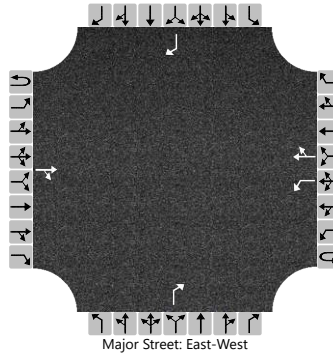
Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

# HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	H.W. Lochner	Intersection	ChannelsideDr&12thSt
Agency/Co.		Jurisdiction	FDOT, District 7
Date Performed	09/24/2021	East/West Street	Channelside Dr
Analysis Year	2036	North/South Street	12th St
Time Analyzed	AM Peak Hour	Peak Hour Factor	0.95
Intersection Orientation	East-West	Analysis Time Period (hrs)	1.00
Project Description	Whiting PD&E Study		

## Lanes



## Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	1	0	0	1	1	0		0	0	1		0	0	1
Configuration				TR		L		TR				R				R
Volume (veh/h)			348	158		10	421	2				89				246
Percent Heavy Vehicles (%)						2						2				2
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized										No				No		
Median Type   Storage	Undivided															

## Critical and Follow-up Headways

Base Critical Headway (sec)					4.1							6.2				6.2
Critical Headway (sec)					4.12							6.22				6.22
Base Follow-Up Headway (sec)					2.2							3.3				3.3
Follow-Up Headway (sec)					2.22							3.32				3.32

## Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)					11							94				259		
Capacity, c (veh/h)					1035							610				614		
v/c Ratio					0.01							0.15				0.42		
95% Queue Length, Q <sub>95</sub> (veh)					0.0							0.5				2.2		
Control Delay (s/veh)					8.5							12.0				15.1		
Level of Service (LOS)					A							B				C		
Approach Delay (s/veh)					0.2						12.0				15.1			
Approach LOS					A						B				C			

# MOVEMENT SUMMARY

**Site: 8 [Channelside Drive at Cumberland Avenue\_Build2036-AM (Site Folder: General)]**

Build 2036 Year -  
 AM Peak Hour  
 Site Category: (None)  
 Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
		[ Total veh/h ]	[ HV % ]	[ Total veh/h ]	[ HV % ]				[ Veh. veh ]	[ Dist ft ]				
South: Channelside Drive														
3	L2	94	2.0	99	2.0	0.428	7.3	LOS A	2.4	60.3	0.37	0.23	0.37	36.7
8	T1	380	2.0	400	2.0	0.428	7.3	LOS A	2.4	60.3	0.37	0.23	0.37	37.5
18	R2	26	2.0	27	2.0	0.428	7.3	LOS A	2.4	60.3	0.37	0.23	0.37	36.2
Approach		500	2.0	526	2.0	0.428	7.3	LOS A	2.4	60.3	0.37	0.23	0.37	37.3
East: E Cumberland Avenue														
1	L2	7	2.0	7	2.0	0.054	4.6	LOS A	0.2	4.8	0.47	0.39	0.47	39.5
6	T1	5	2.0	5	2.0	0.054	4.6	LOS A	0.2	4.8	0.47	0.39	0.47	36.7
16	R2	33	2.0	35	2.0	0.054	4.6	LOS A	0.2	4.8	0.47	0.39	0.47	36.5
Approach		45	2.0	47	2.0	0.054	4.6	LOS A	0.2	4.8	0.47	0.39	0.47	36.9
North: Channelside Drive														
7	L2	53	2.0	56	2.0	0.395	6.7	LOS A	2.1	54.1	0.31	0.17	0.31	37.0
4	T1	421	2.0	443	2.0	0.395	6.7	LOS A	2.1	54.1	0.31	0.17	0.31	38.6
14	R2	244	2.0	257	2.0	0.215	4.9	LOS A	1.0	24.3	0.26	0.14	0.26	34.4
Approach		718	2.0	756	2.0	0.395	6.1	LOS A	2.1	54.1	0.29	0.16	0.29	37.0
West: E Cumberland Avenue														
5	L2	39	2.0	41	2.0	0.109	5.0	LOS A	0.4	10.0	0.48	0.41	0.48	34.7
2	T1	45	2.0	47	2.0	0.109	5.0	LOS A	0.4	10.0	0.48	0.41	0.48	34.4
12	R2	9	2.0	9	2.0	0.109	5.0	LOS A	0.4	10.0	0.48	0.41	0.48	33.3
Approach		93	2.0	98	2.0	0.109	5.0	LOS A	0.4	10.0	0.48	0.41	0.48	34.4
All Vehicles		1356	2.0	1427	2.0	0.428	6.4	LOS A	2.4	60.3	0.34	0.21	0.34	36.9

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# HCS7 Two-Way Stop-Control Report

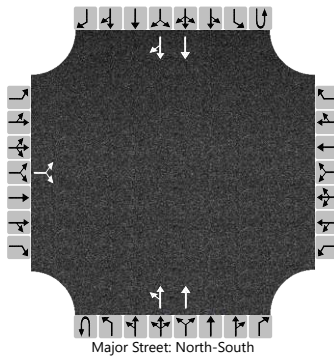
## General Information

Analyst	H.W. Lochner
Agency/Co.	
Date Performed	09/24/2021
Analysis Year	2036
Time Analyzed	AM Peak Hour
Intersection Orientation	North-South
Project Description	Whiting PD&E Study

## Site Information

Intersection	ChannelsideDr&E WhitingSt
Jurisdiction	FDOT, District 7
East/West Street	E Whiting St
North/South Street	Channelside Dr
Peak Hour Factor	0.95
Analysis Time Period (hrs)	1.00

## Lanes



## Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound				
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Movement																	
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6	
Number of Lanes		0	1	0		0	0	0		0	2	0		0	2	0	
Configuration			LR							LT	T				T	TR	
Volume (veh/h)		29		1						27	425				718	98	
Percent Heavy Vehicles (%)		2		2						2							
Proportion Time Blocked																	
Percent Grade (%)		0															
Right Turn Channelized																	
Median Type   Storage		Undivided															

## Critical and Follow-up Headways




















Base Critical Headway (sec)		7.5		6.9						4.1						
Critical Headway (sec)		6.84		6.94						4.14						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.52		3.32						2.22						

## Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			32							28								
Capacity, c (veh/h)			204							778								
v/c Ratio			0.15							0.04								
95% Queue Length, Q <sub>95</sub> (veh)			0.5							0.1								
Control Delay (s/veh)			25.8							9.8								
Level of Service (LOS)			D							A								
Approach Delay (s/veh)		25.8									0.8							
Approach LOS		D																

HCM Signalized Intersection Capacity Analysis  
 130: Channelside Dr & E Washington St/E York St

01/19/2022

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	15	85	5	11	5	58	5	446	8	46	795	115	
Future Volume (vph)	15	85	5	11	5	58	5	446	8	46	795	115	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		5.9			8.4	8.4	6.0	6.0		6.0	6.0		
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95		
Frt		0.99			1.00	0.85	1.00	1.00		1.00	0.98		
Flt Protected		0.99			0.97	1.00	0.95	1.00		0.95	1.00		
Satd. Flow (prot)		1839			1799	1583	1770	3530		1770	3472		
Flt Permitted		0.27			0.72	1.00	0.29	1.00		0.95	1.00		
Satd. Flow (perm)		505			1341	1583	540	3530		1770	3472		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	16	92	5	12	5	63	5	485	9	50	864	125	
RTOR Reduction (vph)	0	1	0	0	0	59	0	1	0	0	6	0	
Lane Group Flow (vph)	0	112	0	0	17	4	5	493	0	50	983	0	
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Prot	NA		
Protected Phases		4			3			2		1	12		
Permitted Phases	4			3		3	2						
Actuated Green, G (s)		23.1			8.3	8.3	60.8	60.8		21.5	88.3		
Effective Green, g (s)		23.1			8.3	8.3	60.8	60.8		21.5	88.3		
Actuated g/C Ratio		0.17			0.06	0.06	0.43	0.43		0.15	0.63		
Clearance Time (s)		5.9			8.4	8.4	6.0	6.0		6.0			
Vehicle Extension (s)		2.0			4.0	4.0	3.0	3.0		2.0			
Lane Grp Cap (vph)		83			79	93	234	1533		271	2189		
v/s Ratio Prot								0.14		0.03	c0.28		
v/s Ratio Perm		c0.22			c0.01	0.00	0.01						
v/c Ratio		1.35			0.22	0.04	0.02	0.32		0.18	0.45		
Uniform Delay, d1		58.5			62.7	62.1	22.6	26.0		51.6	13.3		
Progression Factor		0.77			1.00	1.00	1.00	1.00		0.97	2.13		
Incremental Delay, d2		217.1			1.9	0.2	0.2	0.6		0.1	0.0		
Delay (s)		261.9			64.6	62.3	22.8	26.6		50.0	28.3		
Level of Service		F			E	E	C	C		D	C		
Approach Delay (s)		261.9			62.8			26.6			29.4		
Approach LOS		F			E			C			C		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			45.3		HCM 2000 Level of Service						D		
HCM 2000 Volume to Capacity ratio			0.64										
Actuated Cycle Length (s)			140.0		Sum of lost time (s)						26.3		
Intersection Capacity Utilization			60.4%		ICU Level of Service						B		
Analysis Period (min)			15										

c Critical Lane Group

# Queues

## 130: Channelside Dr & E Washington St/E York St

01/19/2022



Lane Group	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	113	17	63	5	494	50	989
v/c Ratio	1.35	0.22	0.31	0.02	0.32	0.18	0.45
Control Delay	250.7	68.4	4.0	23.6	26.8	51.6	28.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.4
Total Delay	250.7	68.4	4.0	23.6	26.8	51.6	29.1
Queue Length 50th (ft)	~136	15	0	3	154	48	284
Queue Length 95th (ft)	#261	41	0	12	198	m63	373
Internal Link Dist (ft)	927	832			494		591
Turn Bay Length (ft)			430	160		280	
Base Capacity (vph)	84	206	342	234	1535	271	2197
Starvation Cap Reductn	0	0	0	0	0	0	613
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.35	0.08	0.18	0.02	0.32	0.18	0.62

### Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.























# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

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

HCM Signalized Intersection Capacity Analysis  
 129: Channelside Dr & Kennedy Blvd

01/19/2022

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	434	45	89	12	24	8	58	438	23	34	862	1058	
Future Volume (vph)	434	45	89	12	24	8	58	438	23	34	862	1058	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	6.3	6.3	6.3		6.8	6.8	6.3	6.3		6.3	6.3	6.3	
Lane Util. Factor	0.95	0.95	1.00		1.00	1.00	1.00	0.95		1.00	0.95	1.00	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.99		1.00	1.00	0.85	
Flt Protected	0.95	0.96	1.00		0.98	1.00	0.95	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	1681	1701	1583		1832	1583	1770	3513		1770	3539	1583	
Flt Permitted	0.95	0.96	1.00		0.78	1.00	0.10	1.00		0.36	1.00	1.00	
Satd. Flow (perm)	1681	1701	1583		1458	1583	187	3513		674	3539	1583	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	472	49	97	13	26	9	63	476	25	37	937	1150	
RTOR Reduction (vph)	0	0	77	0	0	8	0	3	0	0	0	703	
Lane Group Flow (vph)	260	261	20	0	39	1	63	498	0	37	937	447	
Turn Type	Split	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm	
Protected Phases	3	3			1			2			2		
Permitted Phases			3	1		1	2			2		2	
Actuated Green, G (s)	28.7	28.7	28.7		7.9	7.9	44.4	44.4		44.4	44.4	44.4	
Effective Green, g (s)	28.7	28.7	28.7		7.9	7.9	44.4	44.4		44.4	44.4	44.4	
Actuated g/C Ratio	0.20	0.20	0.20		0.06	0.06	0.32	0.32		0.32	0.32	0.32	
Clearance Time (s)	6.3	6.3	6.3		6.8	6.8	6.3	6.3		6.3	6.3	6.3	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	344	348	324		82	89	59	1114		213	1122	502	
v/s Ratio Prot	c0.15	0.15						0.14			0.26		
v/s Ratio Perm			0.01		c0.03	0.00	c0.34			0.05		0.28	
v/c Ratio	0.76	0.75	0.06		0.48	0.01	1.07	0.45		0.17	0.84	0.89	
Uniform Delay, d1	52.4	52.3	44.8		64.0	62.3	47.8	38.0		34.5	44.4	45.5	
Progression Factor	1.00	1.00	1.00		1.00	1.00	0.53	0.43		1.00	1.00	1.00	
Incremental Delay, d2	9.1	8.8	0.1		4.3	0.0	134.8	1.2		1.8	7.4	20.5	
Delay (s)	61.5	61.1	44.9		68.3	62.4	160.3	17.5		36.3	51.8	66.0	
Level of Service	E	E	D		E	E	F	B		D	D	E	
Approach Delay (s)		58.7			67.2			33.5			59.2		
Approach LOS		E			E			C			E		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			54.9									HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio			0.62										
Actuated Cycle Length (s)			140.0									Sum of lost time (s)	22.4
Intersection Capacity Utilization			98.3%									ICU Level of Service	F
Analysis Period (min)			15										

c Critical Lane Group

Queues

129: Channelside Dr & Kennedy Blvd

01/19/2022



Lane Group	EBL	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	260	261	97	39	9	63	501	37	937	1150
v/c Ratio	0.76	0.75	0.24	0.41	0.05	1.05	0.44	0.17	0.81	0.95
Control Delay	65.6	65.0	7.8	75.1	0.5	160.1	17.0	36.3	49.9	22.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.6	65.0	7.8	75.1	0.5	160.1	17.0	36.3	49.9	22.4
Queue Length 50th (ft)	237	237	0	35	0	~61	189	24	411	113
Queue Length 95th (ft)	313	312	41	73	0	m#155	m240	55	496	#622
Internal Link Dist (ft)		906		876			591		1242	
Turn Bay Length (ft)			140			280		75		375
Base Capacity (vph)	656	664	680	158	259	60	1149	220	1155	1210
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.39	0.14	0.25	0.03	1.05	0.44	0.17	0.81	0.95

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.



# HCM Signalized Intersection Capacity Analysis

## 113: Florida Ave & Selmon Expy Off-Ramp

01/19/2022



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↑↑↑	↑↑			
Traffic Volume (vph)	0	1084	1202	0	0	0
Future Volume (vph)	0	1084	1202	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.6	6.0			
Lane Util. Factor		0.76	0.95			
Frt		0.85	1.00			
Flt Protected		1.00	1.00			
Satd. Flow (prot)		3610	3539			
Flt Permitted		1.00	1.00			
Satd. Flow (perm)		3610	3539			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1178	1307	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	1178	1307	0	0	0
Turn Type		Prot	NA			
Protected Phases		2	1 4			
Permitted Phases						
Actuated Green, G (s)		48.4	79.0			
Effective Green, g (s)		48.4	79.0			
Actuated g/C Ratio		0.35	0.56			
Clearance Time (s)		6.6				
Vehicle Extension (s)		3.0				
Lane Grp Cap (vph)		1248	1997			
v/s Ratio Prot		c0.33	c0.37			
v/s Ratio Perm						
v/c Ratio		0.94	0.65			
Uniform Delay, d1		44.5	21.1			
Progression Factor		1.00	0.35			
Incremental Delay, d2		15.2	0.2			
Delay (s)		59.6	7.6			
Level of Service		E	A			
Approach Delay (s)	59.6		7.6		0.0	
Approach LOS	E		A		A	

### Intersection Summary

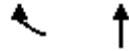
HCM 2000 Control Delay	32.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	100.2%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

## Queues

### 113: Florida Ave & Selmon Expy Off-Ramp

01/19/2022



Lane Group	WBR	NBT
Lane Group Flow (vph)	1178	1307
v/c Ratio	0.94	0.65
Control Delay	59.7	7.9
Queue Delay	0.0	0.0
Total Delay	59.7	7.9
Queue Length 50th (ft)	455	262
Queue Length 95th (ft)	#575	m150
Internal Link Dist (ft)		1
Turn Bay Length (ft)	350	
Base Capacity (vph)	1248	1997
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.94	0.65

#### Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.




















Queue shown is maximum after two cycles.

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

# HCM Signalized Intersection Capacity Analysis

109: Florida Ave & Brorein St

01/19/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					  			  				
Traffic Volume (vph)	0	0	0	0	2093	433	260	2069	0	0	0	0
Future Volume (vph)	0	0	0	0	2093	433	260	2069	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					5.8		6.1	6.1				
Lane Util. Factor					0.86		1.00	0.91				
Frt					0.97		1.00	1.00				
Flt Protected					1.00		0.95	1.00				
Satd. Flow (prot)					6243		1770	5085				
Flt Permitted					1.00		0.95	1.00				
Satd. Flow (perm)					6243		1770	5085				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	2275	471	283	2249	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	19	0	22	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	2727	0	261	2249	0	0	0	0
Turn Type					NA		Perm	NA				
Protected Phases					2			4				
Permitted Phases							4					
Actuated Green, G (s)					54.2		73.9	73.9				
Effective Green, g (s)					54.2		73.9	73.9				
Actuated g/C Ratio					0.37		0.51	0.51				
Clearance Time (s)					5.8		6.1	6.1				
Vehicle Extension (s)					3.0		3.0	3.0				
Lane Grp Cap (vph)					2333		902	2591				
v/s Ratio Prot					c0.44			c0.44				
v/s Ratio Perm							0.15					
v/c Ratio					1.17		0.29	0.87				
Uniform Delay, d1					45.4		20.5	31.3				
Progression Factor					1.00		1.00	1.00				
Incremental Delay, d2					80.9		0.8	4.3				
Delay (s)					126.3		21.3	35.5				
Level of Service					F		C	D				
Approach Delay (s)		0.0			126.3			33.9			0.0	
Approach LOS		A			F			C			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			82.0		HCM 2000 Level of Service			F				
HCM 2000 Volume to Capacity ratio			0.98									
Actuated Cycle Length (s)			145.0		Sum of lost time (s)			14.9				
Intersection Capacity Utilization			87.5%		ICU Level of Service			E				
Analysis Period (min)			15									
c Critical Lane Group												

# Queues

## 109: Florida Ave & Brorein St

01/19/2022



Lane Group	WBT	NBL	NBT
Lane Group Flow (vph)	2746	283	2249
v/c Ratio	1.17	0.31	0.87
Control Delay	120.6	18.2	35.9
Queue Delay	0.0	1.5	46.8
Total Delay	120.6	19.7	82.7
Queue Length 50th (ft)	~891	127	667
Queue Length 95th (ft)	#956	191	737
Internal Link Dist (ft)	416		356
Turn Bay Length (ft)		300	
Base Capacity (vph)	2352	923	2591
Starvation Cap Reductn	0	454	834
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	1.17	0.60	1.28

### Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

# HCM Signalized Intersection Capacity Analysis

## 110: Morgan St & Brorein St & Selmon Expy Off-Ramp

01/19/2022



Movement	WBL	WBT	NBL	NBT	NBR2	SBL	SBT	SBR	SWR	SWR2
Lane Configurations		↕↕	↙	↕	↙	↙	↙		↙	↙
Traffic Volume (vph)	2	2093	148	695	121	529	92	244	876	575
Future Volume (vph)	2	2093	148	695	121	529	92	244	876	575
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.7	5.5	6.0	6.0	5.5	6.0		5.7	5.7
Lane Util. Factor		0.95	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt		1.00	1.00	1.00	0.85	1.00	0.89		1.00	0.85
Flt Protected		1.00	0.95	1.00	1.00	0.95	1.00		1.00	1.00
Satd. Flow (prot)		3539	1770	1863	1583	1770	1660		1863	1583
Flt Permitted		1.00	0.40	1.00	1.00	0.15	1.00		1.00	1.00
Satd. Flow (perm)		3539	738	1863	1583	280	1660		1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2	2275	161	755	132	575	100	265	952	625
RTOR Reduction (vph)	0	0	0	0	32	0	39	0	0	158
Lane Group Flow (vph)	0	2277	161	755	100	575	326	0	952	467
Turn Type	Perm	NA	pm+pt	NA	Perm	pm+pt	NA		Prot	Perm
Protected Phases		2!	7	4		3	8		2!	
Permitted Phases	2		4		4	8				2
Actuated Green, G (s)		46.3	82.0	70.0	70.0	70.5	64.0		46.3	46.3
Effective Green, g (s)		46.3	82.0	70.0	70.0	70.5	64.0		46.3	46.3
Actuated g/C Ratio		0.33	0.59	0.50	0.50	0.50	0.46		0.33	0.33
Clearance Time (s)		5.7	5.5	6.0	6.0	5.5	6.0		5.7	5.7
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		1170	524	931	791	210	758		616	523
v/s Ratio Prot			0.03	c0.41		c0.13	0.20		0.51	
v/s Ratio Perm		0.64	0.15		0.06	c1.25				0.29
v/c Ratio		1.95	0.31	0.81	0.13	2.74	0.43		1.55	0.89
Uniform Delay, d1		46.9	14.7	29.4	18.7	35.9	25.7		46.9	44.5
Progression Factor		0.65	0.88	1.01	0.88	1.47	1.24		1.00	1.00
Incremental Delay, d2		426.1	1.3	6.8	0.3	789.9	1.0		253.5	20.2
Delay (s)		456.7	14.3	36.5	16.8	842.7	32.8		300.3	64.7
Level of Service		F	B	D	B	F	C		F	E
Approach Delay (s)		456.7		30.6			528.2			
Approach LOS		F		C			F			

### Intersection Summary

HCM 2000 Control Delay	324.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	2.33		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	17.2
Intersection Capacity Utilization	197.1%	ICU Level of Service	H
Analysis Period (min)	15		

! Phase conflict between lane groups.

c Critical Lane Group

Queues

110: Morgan St & Brorein St & Selmon Expy Off-Ramp

01/19/2022



Lane Group	WBT	NBL	NBT	NBR2	SBL	SBT	SWR	SWR2
Lane Group Flow (vph)	2277	161	755	132	575	365	952	625
v/c Ratio	1.95	0.31	0.81	0.16	2.73	0.46	1.55	0.92
Control Delay	449.1	12.9	37.4	9.1	801.9	26.8	286.8	47.4
Queue Delay	0.7	0.0	50.2	0.0	0.0	0.0	0.0	0.0
Total Delay	449.9	12.9	87.6	9.1	801.9	26.8	286.8	47.4
Queue Length 50th (ft)	~1732	50	686	27	~894	244	~1217	375
Queue Length 95th (ft)	m#1162	90	848	68	m#1079	m293	#1474	#624
Internal Link Dist (ft)	494		424			563		
Turn Bay Length (ft)		250		10			300	300
Base Capacity (vph)	1170	527	931	823	211	797	616	681
Starvation Cap Reductn	174	0	269	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	2.29	0.31	1.14	0.16	2.73	0.46	1.55	0.92

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

# HCM 6th Signalized Intersection Summary

111: Jefferson St & Brorein St

01/19/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↕		↖	↕		↖	↗	↖
Traffic Volume (veh/h)	162	164	37	30	1953	214	38	315	3	323	510	104
Future Volume (veh/h)	162	164	37	30	1953	214	38	315	3	323	510	104
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	176	178	40	33	2123	233	41	342	3	351	554	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	172	890	200	627	1602	173	121	678	6	317	445	
Arrive On Green	0.07	0.60	0.60	0.66	0.66	0.66	0.04	0.19	0.19	0.12	0.32	0.00
Sat Flow, veh/h	1781	1478	332	1163	3236	349	1781	3610	32	1781	1870	1585
Grp Volume(v), veh/h	176	0	218	33	1148	1208	41	168	177	351	554	0
Grp Sat Flow(s),veh/h/ln	1781	0	1811	1163	1777	1808	1781	1777	1865	1781	1870	1585
Q Serve(g_s), s	9.5	0.0	7.6	1.4	69.3	69.3	2.5	11.9	11.9	12.5	33.3	0.0
Cycle Q Clear(g_c), s	9.5	0.0	7.6	1.4	69.3	69.3	2.5	11.9	11.9	12.5	33.3	0.0
Prop In Lane	1.00		0.18	1.00		0.19	1.00		0.02	1.00		1.00
Lane Grp Cap(c), veh/h	172	0	1090	627	880	895	121	334	350	317	445	
V/C Ratio(X)	1.02	0.00	0.20	0.05	1.30	1.35	0.34	0.50	0.50	1.11	1.25	
Avail Cap(c_a), veh/h	172	0	1090	627	880	895	121	334	350	317	445	
HCM Platoon Ratio	1.00	1.00	1.00	1.33	1.33	1.33	1.00	1.00	1.00	1.33	1.33	1.33
Upstream Filter(l)	0.09	0.00	0.09	0.09	0.09	0.09	0.09	0.09	0.09	1.00	1.00	0.00
Uniform Delay (d), s/veh	46.2	0.0	12.6	12.3	23.9	23.9	45.3	51.0	51.0	49.1	47.9	0.0
Incr Delay (d2), s/veh	26.2	0.0	0.0	0.0	138.0	158.3	0.7	0.5	0.5	82.6	128.1	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.2	0.0	3.1	0.4	58.0	64.1	1.2	5.4	5.6	12.5	30.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	72.3	0.0	12.6	12.3	161.9	182.2	45.9	51.5	51.5	131.7	175.9	0.0
LnGrp LOS	F	A	B	B	F	F	D	D	D	F	F	
Approach Vol, veh/h		394			2389			386			905	A
Approach Delay, s/veh		39.3			170.1			50.9			158.8	
Approach LOS		D			F			D			F	
Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	15.0	75.0	18.0	32.0		90.0	11.0	39.0				
Change Period (Y+Rc), s	5.5	* 5.7	5.5	* 5.7		* 5.7	5.5	* 5.7				
Max Green Setting (Gmax), s	9.5	* 69	12.5	* 26		* 84	5.5	* 33				
Max Q Clear Time (g_c+I1), s	11.5	71.3	14.5	13.9		9.6	4.5	35.3				
Green Ext Time (p_c), s	0.0	0.0	0.0	1.0		1.4	0.0	0.0				

## Intersection Summary

HCM 6th Ctrl Delay	143.7
HCM 6th LOS	F

## Notes

- \* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
- Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Queues

111: Jefferson St & Brorein St

01/19/2022



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	176	218	33	2356	41	345	351	554	113
v/c Ratio	1.02	0.20	0.06	1.36	0.33	0.52	1.18	1.25	0.25
Control Delay	59.8	3.2	21.7	191.3	23.0	39.9	137.4	161.6	7.0
Queue Delay	0.0	0.5	0.0	4.3	4.9	0.0	1.6	0.0	0.1
Total Delay	59.8	3.7	21.7	195.6	27.9	39.9	139.0	161.6	7.1
Queue Length 50th (ft)	~121	69	15	~1470	21	157	~195	~610	1
Queue Length 95th (ft)	m37	m6	m14	m#1261	m21	m156	m#570	m#842	m23
Internal Link Dist (ft)		494		148		443		116	
Turn Bay Length (ft)	150		50		100		50		
Base Capacity (vph)	173	1096	573	1731	123	665	298	443	458
Starvation Cap Reductn	0	0	0	344	0	0	0	0	0
Spillback Cap Reductn	0	533	0	1048	44	0	36	0	38
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.02	0.39	0.06	3.45	0.52	0.52	1.34	1.25	0.27

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.



HCM 6th Signalized Intersection Summary  
 112: Nebraska Ave & Brorein St

01/19/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	77	335	78	3	1699	5	332	81	99	21	194	166
Future Volume (veh/h)	77	335	78	3	1699	5	332	81	99	21	194	166
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	84	364	85	3	1847	5	361	88	108	23	211	180
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	51	726	169	398	1800	5	278	57	70	52	402	328
Arrive On Green	0.66	0.66	0.66	0.99	0.99	0.99	0.42	0.42	0.42	0.42	0.42	0.42
Sat Flow, veh/h	249	1466	342	941	3636	10	556	135	166	59	948	775
Grp Volume(v), veh/h	84	0	449	3	902	950	557	0	0	414	0	0
Grp Sat Flow(s),veh/h/ln	249	0	1809	941	1777	1869	857	0	0	1782	0	0
Q Serve(g_s), s	0.0	0.0	17.7	0.1	69.3	69.3	34.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	69.3	0.0	17.7	17.8	69.3	69.3	59.3	0.0	0.0	25.3	0.0	0.0
Prop In Lane	1.00		0.19	1.00		0.01	0.65		0.19	0.06		0.43
Lane Grp Cap(c), veh/h	51	0	895	398	880	925	405	0	0	782	0	0
V/C Ratio(X)	1.63	0.00	0.50	0.01	1.03	1.03	1.37	0.00	0.00	0.53	0.00	0.00
Avail Cap(c_a), veh/h	51	0	895	398	880	925	405	0	0	782	0	0
HCM Platoon Ratio	1.33	1.33	1.33	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.49	0.00	0.49	0.44	0.44	0.44	0.96	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	58.6	0.0	15.1	2.8	0.7	0.7	48.9	0.0	0.0	30.6	0.0	0.0
Incr Delay (d2), s/veh	323.9	0.0	1.0	0.0	27.0	26.8	182.6	0.0	0.0	2.6	0.0	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.4	0.0	6.6	0.0	6.9	7.2	35.3	0.0	0.0	11.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	382.5	0.0	16.1	2.8	27.7	27.5	231.5	0.0	0.0	33.1	0.0	0.0
LnGrp LOS	F	A	B	A	F	F	F	A	A	C	A	A
Approach Vol, veh/h		533			1855			557			414	
Approach Delay, s/veh		73.8			27.6			231.5			33.1	
Approach LOS		E			C			F			C	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		75.0		65.0		75.0		65.0				
Change Period (Y+Rc), s		* 5.7		* 5.7		* 5.7		* 5.7				
Max Green Setting (Gmax), s		* 69		* 59		* 69		* 59				
Max Q Clear Time (g_c+I1), s		71.3		61.3		71.3		27.3				
Green Ext Time (p_c), s		0.0		0.0		0.0		3.2				

Intersection Summary

HCM 6th Ctrl Delay	69.4
HCM 6th LOS	E

Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Queues

112: Nebraska Ave & Brorein St

01/19/2022



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	84	449	3	1852	557	414
v/c Ratio	1.58	0.50	0.01	1.06	1.51	0.58
Control Delay	340.1	32.1	6.7	52.7	271.9	34.4
Queue Delay	0.0	56.0	0.0	18.5	26.6	69.0
Total Delay	340.1	88.2	6.7	71.2	298.5	103.5
Queue Length 50th (ft)	~103	246	0	~985	~702	281
Queue Length 95th (ft)	m#125	m243	m1	#1097	#930	393
Internal Link Dist (ft)		148		203	457	414
Turn Bay Length (ft)	50		70			
Base Capacity (vph)	53	902	345	1751	368	712
Starvation Cap Reductn	0	496	0	141	0	0
Spillback Cap Reductn	0	0	0	473	287	560
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.58	1.11	0.01	1.45	6.88	2.72

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

# HCM 6th Signalized Intersection Summary

701: Water St

01/19/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↕		↖	↗		↖	↗	
Traffic Volume (veh/h)	29	175	250	31	1605	168	73	96	32	1	164	24
Future Volume (veh/h)	29	175	250	31	1605	168	73	96	32	1	164	24
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	32	190	272	34	1745	183	79	104	35	1	178	26
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	104	481	689	694	2251	232	218	368	124	196	300	44
Arrive On Green	1.00	1.00	1.00	0.46	0.46	0.46	0.02	0.09	0.09	0.19	0.19	0.19
Sat Flow, veh/h	231	695	996	930	3252	335	1781	1339	451	1250	1595	233
Grp Volume(v), veh/h	32	0	462	34	940	988	79	0	139	1	0	204
Grp Sat Flow(s),veh/h/ln	231	0	1691	930	1777	1810	1781	0	1789	1250	0	1828
Q Serve(g_s), s	16.3	0.0	0.0	2.8	61.5	64.6	0.0	0.0	10.1	0.1	0.0	14.3
Cycle Q Clear(g_c), s	81.3	0.0	0.0	3.0	61.5	64.6	0.0	0.0	10.1	10.2	0.0	14.3
Prop In Lane	1.00		0.59	1.00		0.19	1.00		0.25	1.00		0.13
Lane Grp Cap(c), veh/h	104	0	1171	694	1230	1253	218	0	492	196	0	343
V/C Ratio(X)	0.31	0.00	0.39	0.05	0.76	0.79	0.36	0.00	0.28	0.01	0.00	0.59
Avail Cap(c_a), veh/h	104	0	1171	694	1230	1253	218	0	492	196	0	343
HCM Platoon Ratio	1.67	1.67	1.67	0.67	0.67	0.67	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	0.86	0.00	0.86	0.09	0.09	0.09	0.93	0.00	0.93	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.3	0.0	0.0	12.4	28.0	28.9	60.4	0.0	50.8	54.8	0.0	52.0
Incr Delay (d2), s/veh	6.5	0.0	0.9	0.0	0.4	0.5	4.3	0.0	1.3	0.0	0.0	7.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	0.3	0.6	27.7	29.6	3.0	0.0	5.1	0.0	0.0	7.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.8	0.0	0.9	12.4	28.5	29.4	64.7	0.0	52.1	54.9	0.0	59.3
LnGrp LOS	C	A	A	B	C	C	E	A	D	D	A	E
Approach Vol, veh/h		494			1962			218				205
Approach Delay, s/veh		3.0			28.6			56.7				59.3
Approach LOS		A			C			E				E
Timer - Assigned Phs		2		4		6	7	8				
Phs Duration (G+Y+Rc), s		102.8		44.2		102.8	12.2	32.0				
Change Period (Y+Rc), s		* 5.7		* 5.7		* 5.7	* 5.7	* 5.7				
Max Green Setting (Gmax), s		* 90		* 38		* 90	* 6.5	* 26				
Max Q Clear Time (g_c+I1), s		66.6		12.1		83.3	2.0	16.3				
Green Ext Time (p_c), s		17.1		0.8		2.2	0.1	0.8				

## Intersection Summary

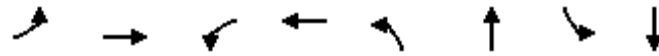
HCM 6th Ctrl Delay	28.5
HCM 6th LOS	C

## Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Queues  
701: Water St

01/19/2022



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	32	462	34	1928	79	139	1	204
v/c Ratio	0.62	0.41	0.07	0.85	0.29	0.28	0.00	0.59
Control Delay	56.8	8.7	8.3	15.1	40.6	34.6	46.0	58.4
Queue Delay	0.0	0.4	0.0	47.0	0.0	0.0	0.0	0.0
Total Delay	56.8	9.1	8.3	62.1	40.6	34.6	46.0	58.4
Queue Length 50th (ft)	12	112	8	501	56	95	1	167
Queue Length 95th (ft)	m#52	m115	m8	m250	m76	m124	6	254
Internal Link Dist (ft)		203		452		462		361
Turn Bay Length (ft)	70		70		150		150	
Base Capacity (vph)	52	1132	521	2256	276	498	208	347
Starvation Cap Reductn	0	271	0	642	0	0	0	0
Spillback Cap Reductn	0	0	0	513	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.54	0.07	1.19	0.29	0.28	0.00	0.59

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

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

HCM 6th Signalized Intersection Summary  
 120: Meridian Ave & Cumberland Ave

01/19/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↘			↖	↗	↖	↕		↗	↖	↗
Traffic Volume (veh/h)	131	34	43	11	403	152	131	633	91	218	823	1286
Future Volume (veh/h)	131	34	43	11	403	152	131	633	91	218	823	1286
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	142	37	47	12	438	0	142	688	99	237	895	1398
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	194	234	297	33	575		161	1256	181	540	1833	817
Arrive On Green	0.31	0.31	0.31	0.31	0.31	0.00	0.07	0.81	0.81	0.05	0.17	0.17
Sat Flow, veh/h	951	748	951	22	1839	1585	1781	3118	448	1781	3554	1585
Grp Volume(v), veh/h	142	0	84	450	0	0	142	392	395	237	895	1398
Grp Sat Flow(s),veh/h/ln	951	0	1699	1861	0	1585	1781	1777	1790	1781	1777	1585
Q Serve(g_s), s	13.1	0.0	5.0	6.3	0.0	0.0	5.0	10.7	10.8	9.5	31.9	72.2
Cycle Q Clear(g_c), s	43.6	0.0	5.0	30.6	0.0	0.0	5.0	10.7	10.8	9.5	31.9	72.2
Prop In Lane	1.00		0.56	0.03		1.00	1.00		0.25	1.00		1.00
Lane Grp Cap(c), veh/h	194	0	532	609	0		161	716	721	540	1833	817
V/C Ratio(X)	0.73	0.00	0.16	0.74	0.00		0.88	0.55	0.55	0.44	0.49	1.71
Avail Cap(c_a), veh/h	194	0	532	609	0		161	716	721	540	1833	817
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	0.33	0.33	0.33
Upstream Filter(I)	0.92	0.00	0.92	1.00	0.00	0.00	0.54	0.54	0.54	0.65	0.65	0.65
Uniform Delay (d), s/veh	55.2	0.0	34.8	43.5	0.0	0.0	36.6	9.2	9.2	18.1	41.4	58.1
Incr Delay (d2), s/veh	19.8	0.0	0.6	7.9	0.0	0.0	28.7	1.6	1.6	1.7	0.6	323.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.1	0.0	2.2	15.6	0.0	0.0	3.9	3.1	3.1	4.4	15.4	104.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	75.0	0.0	35.4	51.4	0.0	0.0	65.3	10.8	10.8	19.8	42.0	381.1
LnGrp LOS	E	A	D	D	A		E	B	B	B	D	F
Approach Vol, veh/h		226			450	A		929			2530	
Approach Delay, s/veh		60.3			51.4			19.1			227.3	
Approach LOS		E			D			B			F	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.4	78.6		50.0	27.2	62.8		50.0				
Change Period (Y+Rc), s	6.4	6.4		* 6.2	6.4	6.4		* 6.2				
Max Green Setting (Gmax), s	5.0	72.2		* 44	20.8	56.4		* 44				
Max Q Clear Time (g_c+I1), s	7.0	74.2		45.6	11.5	12.8		32.6				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.7	5.3		2.2				

Intersection Summary

HCM 6th Ctrl Delay	152.2
HCM 6th LOS	F

Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.  
 Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

# Queues

## 120: Meridian Ave & Cumberland Ave

01/19/2022



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	142	84	450	165	142	787	237	895	1398
v/c Ratio	1.18	0.15	0.78	0.28	0.48	0.56	0.54	0.49	1.54
Control Delay	177.9	18.7	54.4	11.5	14.1	21.1	12.4	8.4	266.2
Queue Delay	0.0	0.0	0.0	0.0	0.8	0.5	0.0	0.0	0.6
Total Delay	177.9	18.7	54.4	11.5	14.9	21.6	12.4	8.4	266.9
Queue Length 50th (ft)	~158	30	373	25	34	165	36	103	~1815
Queue Length 95th (ft)	#298	79	508	82	m45	m183	97	239	#2079
Internal Link Dist (ft)		452	888			460		712	
Turn Bay Length (ft)	100			100	200		250		
Base Capacity (vph)	120	566	578	581	294	1407	441	1825	909
Starvation Cap Reductn	0	0	0	0	0	261	0	0	87
Spillback Cap Reductn	0	0	0	0	35	0	0	0	102
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.18	0.15	0.78	0.28	0.55	0.69	0.54	0.49	1.73

### Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.






















Queue shown is maximum after two cycles.

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

# HCM Signalized Intersection Capacity Analysis

## 102: Florida Ave & Whiting St

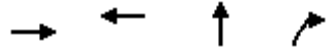
01/19/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 			   				
Traffic Volume (vph)	125	464	0	0	723	155	136	2022	107	0	0	0
Future Volume (vph)	125	464	0	0	723	155	136	2022	107	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			5.7	5.7			
Lane Util. Factor		0.95			0.95			0.91	1.00			
Frt		1.00			0.97			1.00	0.85			
Flt Protected		0.99			1.00			1.00	1.00			
Satd. Flow (prot)		3502			3446			5069	1583			
Flt Permitted		0.50			1.00			1.00	1.00			
Satd. Flow (perm)		1777			3446			5069	1583			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	136	504	0	0	786	168	148	2198	116	0	0	0
RTOR Reduction (vph)	0	0	0	0	13	0	0	0	18	0	0	0
Lane Group Flow (vph)	0	640	0	0	941	0	0	2346	98	0	0	0
Turn Type	Perm	NA			NA		Perm	NA	Perm			
Protected Phases		4			4			2				
Permitted Phases	4						2		2			
Actuated Green, G (s)		49.0			49.0			74.3	74.3			
Effective Green, g (s)		49.0			49.0			74.3	74.3			
Actuated g/C Ratio		0.35			0.35			0.53	0.53			
Clearance Time (s)		6.0			6.0			5.7	5.7			
Vehicle Extension (s)		3.0			3.0			3.0	3.0			
Lane Grp Cap (vph)		621			1206			2690	840			
v/s Ratio Prot					0.27							
v/s Ratio Perm		c0.36						0.46	0.06			
v/c Ratio		1.74dl			0.78			0.87	0.12			
Uniform Delay, d1		45.5			40.7			28.7	16.4			
Progression Factor		1.00			0.66			1.00	1.00			
Incremental Delay, d2		44.2			0.5			4.2	0.3			
Delay (s)		89.7			27.3			32.9	16.7			
Level of Service		F			C			C	B			
Approach Delay (s)		89.7			27.3			32.2			0.0	
Approach LOS		F			C			C			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			40.1					HCM 2000 Level of Service		D		
HCM 2000 Volume to Capacity ratio			0.91									
Actuated Cycle Length (s)			140.0					Sum of lost time (s)		13.7		
Intersection Capacity Utilization			98.0%					ICU Level of Service		F		
Analysis Period (min)			15									
dl Defacto Left Lane. Recode with 1 though lane as a left lane.												
c Critical Lane Group												

Queues

102: Florida Ave & Whiting St

01/19/2022



Lane Group	EBT	WBT	NBT	NBR
Lane Group Flow (vph)	640	954	2346	116
v/c Ratio	1.74dl	0.78	0.87	0.14
Control Delay	88.5	27.0	33.3	11.3
Queue Delay	0.0	1.4	36.5	0.0
Total Delay	88.5	28.4	69.9	11.3
Queue Length 50th (ft)	~327	165	663	34
Queue Length 95th (ft)	#452	m91	735	67
Internal Link Dist (ft)	821	519	567	
Turn Bay Length (ft)				100
Base Capacity (vph)	621	1219	2690	858
Starvation Cap Reductn	0	113	512	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.03	0.86	1.08	0.14





















Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.
- dl Defacto Left Lane. Recode with 1 though lane as a left lane.



HCM Signalized Intersection Capacity Analysis  
103: Morgan St & Whiting St

01/19/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	59	134	297	221	831	145	100	608	63	46	520	128
Future Volume (vph)	59	134	297	221	831	145	100	608	63	46	520	128
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.8	5.8		5.8	5.8			5.7			5.7	
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	
Frt	1.00	0.90		1.00	0.98			0.99			0.97	
Flt Protected	0.95	1.00		0.95	1.00			0.99			1.00	
Satd. Flow (prot)	1770	1670		1770	1821			3474			3430	
Flt Permitted	0.12	1.00		0.12	1.00			0.60			0.71	
Satd. Flow (perm)	218	1670		218	1821			2107			2439	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	64	146	323	240	903	158	109	661	68	50	565	139
RTOR Reduction (vph)	0	57	0	0	5	0	0	5	0	0	14	0
Lane Group Flow (vph)	64	412	0	240	1056	0	0	833	0	0	740	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	4			2			2	
Permitted Phases	4			4			2			2		
Actuated Green, G (s)	34.2	34.2		69.4	34.2			53.3			53.3	
Effective Green, g (s)	34.2	34.2		69.4	34.2			53.3			53.3	
Actuated g/C Ratio	0.24	0.24		0.50	0.24			0.38			0.38	
Clearance Time (s)	5.8	5.8		5.8	5.8			5.7			5.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	53	407		498	444			802			928	
v/s Ratio Prot		0.25		c0.12	c0.58							
v/s Ratio Perm	0.29			0.12				c0.40			0.30	
v/c Ratio	1.21	1.01		0.48	2.38			1.04			0.80	
Uniform Delay, d1	52.9	52.9		26.2	52.9			43.4			38.6	
Progression Factor	0.95	0.89		1.33	0.78			1.34			1.00	
Incremental Delay, d2	151.7	34.2		2.8	626.5			32.9			7.1	
Delay (s)	201.8	81.2		37.6	667.8			90.8			45.7	
Level of Service	F	F		D	F			F			D	
Approach Delay (s)		95.7			551.5			90.8			45.7	
Approach LOS		F			F			F			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			256.6	HCM 2000 Level of Service				F				
HCM 2000 Volume to Capacity ratio			1.25									
Actuated Cycle Length (s)			140.0	Sum of lost time (s)				17.3				
Intersection Capacity Utilization			121.6%	ICU Level of Service				H				
Analysis Period (min)			15									

c Critical Lane Group

Queues

103: Morgan St & Whiting St

01/19/2022



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	64	469	240	1061	838	754
v/c Ratio	1.21	1.01	0.48	2.36	1.04	0.80
Control Delay	195.2	71.1	36.9	641.0	86.8	45.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	195.2	71.1	36.9	641.0	86.8	45.1
Queue Length 50th (ft)	~69	~198	138	~1602	~440	312
Queue Length 95th (ft)	m#86	m#254	m189	#1845	m#550	398
Internal Link Dist (ft)		519		503	563	436
Turn Bay Length (ft)			150			
Base Capacity (vph)	53	464	498	449	807	942
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.21	1.01	0.48	2.36	1.04	0.80

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

# HCM Signalized Intersection Capacity Analysis

## 104: Jefferson St & Whiting St

01/19/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	18	146	140	81	609	273	100	211	9	32	731	173
Future Volume (vph)	18	146	140	81	609	273	100	211	9	32	731	173
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.1			6.1			6.1			6.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.93			0.96			1.00			0.97	
Flt Protected		1.00			1.00			0.98			1.00	
Satd. Flow (prot)		3286			3374			3470			3435	
Flt Permitted		0.80			0.85			0.50			0.92	
Satd. Flow (perm)		2625			2879			1763			3183	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	20	159	152	88	662	297	109	229	10	35	795	188
RTOR Reduction (vph)	0	90	0	0	31	0	0	2	0	0	12	0
Lane Group Flow (vph)	0	241	0	0	1016	0	0	346	0	0	1006	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		Perm	NA	
Protected Phases		8		7	4		1	6			2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)		57.5			57.5			62.9			63.0	
Effective Green, g (s)		57.5			57.5			62.9			63.0	
Actuated g/C Ratio		0.41			0.41			0.45			0.45	
Clearance Time (s)		6.1			6.1			6.1			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1078			1182			792			1432	
v/s Ratio Prot												
v/s Ratio Perm		0.09			0.35			0.20			0.32	
v/c Ratio		0.22			0.86			0.44			0.70	
Uniform Delay, d1		26.8			37.6			26.4			31.0	
Progression Factor		1.89			0.38			0.90			1.00	
Incremental Delay, d2		0.1			6.0			0.3			2.9	
Delay (s)		50.7			20.5			24.0			33.9	
Level of Service		D			C			C			C	
Approach Delay (s)		50.7			20.5			24.0			33.9	
Approach LOS		D			C			C			C	

### Intersection Summary

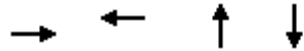
HCM 2000 Control Delay	29.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	92.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

# Queues

## 104: Jefferson St & Whiting St

01/19/2022



Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	331	1047	348	1018
v/c Ratio	0.28	0.86	0.44	0.70
Control Delay	26.7	21.5	25.4	33.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	26.7	21.5	25.4	33.6
Queue Length 50th (ft)	87	116	98	379
Queue Length 95th (ft)	m100	189	m117	461
Internal Link Dist (ft)	503	427	450	207
Turn Bay Length (ft)				
Base Capacity (vph)	1167	1262	793	1444
Starvation Cap Reductn	0	3	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.28	0.83	0.44	0.70

### Intersection Summary

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

# HCM Signalized Intersection Capacity Analysis

## 715: Selmon Expy Off-Ramp & Whiting St

01/19/2022



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	↗↗
Traffic Volume (vph)	194	0	0	808	161	864
Future Volume (vph)	194	0	0	808	161	864
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.7			5.7	6.0	6.0
Lane Util. Factor	0.95			0.95	1.00	0.88
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3539			3539	1770	2787
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3539			3539	1770	2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	211	0	0	878	175	939
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	211	0	0	878	175	939
Turn Type	NA			NA	Prot	custom
Protected Phases	5			2	4	4 6
Permitted Phases						
Actuated Green, G (s)	13.8			84.3	44.0	114.5
Effective Green, g (s)	13.8			84.3	44.0	108.8
Actuated g/C Ratio	0.10			0.60	0.31	0.78
Clearance Time (s)	5.7			5.7	6.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	348			2130	556	2165
v/s Ratio Prot	c0.06			0.25	0.10	c0.34
v/s Ratio Perm						
v/c Ratio	0.61			0.41	0.31	0.43
Uniform Delay, d1	60.5			14.7	36.5	5.2
Progression Factor	0.87			0.46	1.00	1.00
Incremental Delay, d2	2.8			0.4	1.5	0.6
Delay (s)	55.2			7.2	38.0	5.9
Level of Service	E			A	D	A
Approach Delay (s)	55.2			7.2	10.9	
Approach LOS	E			A	B	

### Intersection Summary

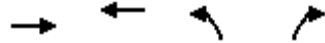
HCM 2000 Control Delay	13.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	17.4
Intersection Capacity Utilization	48.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

## Queues

### 715: Selmon Expy Off-Ramp & Whiting St

01/19/2022



Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	577	573	177	673
v/c Ratio	0.75	0.27	0.32	0.34
Control Delay	43.8	13.7	38.6	9.5
Queue Delay	0.0	0.9	0.0	0.0
Total Delay	43.8	14.6	38.6	9.5
Queue Length 50th (ft)	227	176	123	125
Queue Length 95th (ft)	m260	m194	190	193
Internal Link Dist (ft)	427	276	783	
Turn Bay Length (ft)			350	350
Base Capacity (vph)	1625	2130	556	1951
Starvation Cap Reductn	0	1219	0	0
Spillback Cap Reductn	111	0	0	3
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.38	0.63	0.32	0.35

#### Intersection Summary

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

HCM 6th Signalized Intersection Summary  
 11: Water St/Brush St & Whiting St

01/19/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗		↖	↗			↕	
Traffic Volume (veh/h)	224	662	172	99	677	91	23	110	81	70	276	108
Future Volume (veh/h)	224	662	172	99	677	91	23	110	81	70	276	108
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	243	720	187	108	736	99	25	120	88	76	300	117
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	458	2060	954	457	1693	228	172	259	190	70	187	71
Arrive On Green	0.16	1.00	1.00	0.04	0.54	0.54	0.02	0.26	0.26	0.20	0.20	0.20
Sat Flow, veh/h	1781	3554	1585	1781	3148	423	1781	1003	735	205	958	362
Grp Volume(v), veh/h	243	720	187	108	415	420	25	0	208	493	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1794	1781	0	1738	1524	0	0
Q Serve(g_s), s	8.7	0.0	0.0	3.8	19.7	19.8	1.5	0.0	14.1	22.0	0.0	0.0
Cycle Q Clear(g_c), s	8.7	0.0	0.0	3.8	19.7	19.8	1.5	0.0	14.1	27.3	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.24	1.00		0.42	0.15		0.24
Lane Grp Cap(c), veh/h	458	2060	954	457	956	965	172	0	448	327	0	0
V/C Ratio(X)	0.53	0.35	0.20	0.24	0.43	0.43	0.15	0.00	0.46	1.51	0.00	0.00
Avail Cap(c_a), veh/h	863	2060	954	554	956	965	289	0	562	327	0	0
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.89	0.89	0.89	0.64	0.64	0.64	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	12.3	0.0	0.0	13.2	19.5	19.5	41.9	0.0	43.8	58.3	0.0	0.0
Incr Delay (d2), s/veh	0.8	0.4	0.4	0.2	0.9	0.9	0.4	0.0	0.7	244.0	0.0	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	0.1	0.1	1.6	8.4	8.5	0.7	0.0	6.3	34.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.2	0.4	0.4	13.3	20.4	20.4	42.3	0.0	44.5	302.2	0.0	0.0
LnGrp LOS	B	A	A	B	C	C	D	A	D	F	A	A
Approach Vol, veh/h		1150			943			233			493	
Approach Delay, s/veh		3.1			19.6			44.3			302.2	
Approach LOS		A			B			D			F	
Timer - Assigned Phs	1	2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s	17.2	81.0		41.8	11.3	86.8	8.8	33.0				
Change Period (Y+Rc), s	* 5.7	* 5.7		* 5.7	5.5	* 5.7	* 5.7	* 5.7				
Max Green Setting (Gmax), s	* 43	* 34		* 45	13.5	* 64	* 12	* 27				
Max Q Clear Time (g_c+I1), s	10.7	21.8		16.1	5.8	2.0	3.5	29.3				
Green Ext Time (p_c), s	0.7	4.3		1.4	0.1	6.8	0.0	0.0				

Intersection Summary

HCM 6th Ctrl Delay	64.3
HCM 6th LOS	E

Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Queues

11: Water St/Brush St & Whiting St

01/21/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	243	720	187	108	835	25	208	493
v/c Ratio	0.60	0.42	0.19	0.27	0.56	0.14	0.36	1.29
Control Delay	22.5	18.8	0.9	12.2	38.6	34.3	33.2	190.6
Queue Delay	0.1	0.9	0.3	0.0	1.1	0.0	0.0	0.0
Total Delay	22.6	19.7	1.3	12.2	39.8	34.3	33.2	190.6
Queue Length 50th (ft)	83	168	0	50	360	16	125	~564
Queue Length 95th (ft)	158	214	13	m52	m386	38	197	#813
Internal Link Dist (ft)		276			426		126	215
Turn Bay Length (ft)	100		200	300		50		
Base Capacity (vph)	656	1734	1050	449	1487	235	583	382
Starvation Cap Reductn	42	684	475	0	398	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.69	0.33	0.24	0.77	0.11	0.36	1.29

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

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



# HCM Signalized Intersection Capacity Analysis

## 7: Meridian Ave & Whiting St

01/19/2022



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	482	331	379	672	1917	488
Future Volume (vph)	482	331	379	672	1917	488
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	6.9	6.4	6.6	4.0
Lane Util. Factor	0.97	1.00	1.00	0.91	0.86	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3433	1583	1770	5085	6408	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3433	1583	1770	5085	6408	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	524	360	412	730	2084	530
RTOR Reduction (vph)	0	217	0	0	0	0
Lane Group Flow (vph)	524	143	412	730	2084	530
Turn Type	Prot	Perm	Prot	NA	NA	Free
Protected Phases	7 8		1	6	2	
Permitted Phases		7 8				Free
Actuated Green, G (s)	52.8	52.8	27.6	73.1	38.4	140.0
Effective Green, g (s)	52.8	52.8	27.6	73.1	38.4	140.0
Actuated g/C Ratio	0.38	0.38	0.20	0.52	0.27	1.00
Clearance Time (s)			6.9	6.4	6.6	
Vehicle Extension (s)			3.0	3.0	3.0	
Lane Grp Cap (vph)	1294	597	348	2655	1757	1583
v/s Ratio Prot	c0.15		c0.23	0.14	c0.33	
v/s Ratio Perm		0.09				0.33
v/c Ratio	0.40	0.24	1.18	0.27	1.19	0.33
Uniform Delay, d1	32.1	29.8	56.2	18.7	50.8	0.0
Progression Factor	0.71	2.56	0.58	0.21	1.00	1.00
Incremental Delay, d2	0.2	0.2	106.6	0.2	89.8	0.6
Delay (s)	23.0	76.6	139.1	4.2	140.6	0.6
Level of Service	C	E	F	A	F	A
Approach Delay (s)	44.8			52.9	112.2	
Approach LOS	D			D	F	

### Intersection Summary

HCM 2000 Control Delay	84.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.7
Intersection Capacity Utilization	77.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

# Queues

## 7: Meridian Ave & Whiting St

01/21/2022



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	524	360	412	730	2084	530
v/c Ratio	0.39	0.43	1.18	0.27	1.19	0.33
Control Delay	21.9	8.3	139.2	4.4	133.9	0.6
Queue Delay	0.0	0.4	0.6	0.2	0.5	0.0
Total Delay	21.9	8.8	139.8	4.6	134.3	0.6
Queue Length 50th (ft)	181	116	~418	43	~661	0
Queue Length 95th (ft)	m208	m181	#745	52	#736	0
Internal Link Dist (ft)	426			229	186	
Turn Bay Length (ft)	200	250	150			
Base Capacity (vph)	1581	917	348	2655	1757	1583
Starvation Cap Reductn	0	220	20	956	0	0
Spillback Cap Reductn	0	13	0	0	241	68
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.52	1.26	0.43	1.37	0.35

### Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis  
 107: Meridian Ave & Whiting St

01/19/2022



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		↑↑↑		W	↑↑↑
Traffic Volume (vph)	103	188	863	53	24	2224
Future Volume (vph)	103	188	863	53	24	2224
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.7		6.4		5.5	6.9
Lane Util. Factor	1.00		0.91		1.00	0.91
Frt	0.91		0.99		1.00	1.00
Flt Protected	0.98		1.00		0.95	1.00
Satd. Flow (prot)	1671		5041		1770	5085
Flt Permitted	0.98		1.00		0.23	1.00
Satd. Flow (perm)	1671		5041		431	5085
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	112	204	938	58	26	2417
RTOR Reduction (vph)	51	0	4	0	0	0
Lane Group Flow (vph)	265	0	992	0	26	2417
Turn Type	Prot		NA		custom	NA
Protected Phases	8		6		7	1 2 7
Permitted Phases					1 2	
Actuated Green, G (s)	28.8		73.1		91.4	98.0
Effective Green, g (s)	28.8		73.1		84.5	91.4
Actuated g/C Ratio	0.21		0.52		0.60	0.65
Clearance Time (s)	7.7		6.4		5.5	
Vehicle Extension (s)	3.0		3.0		3.0	
Lane Grp Cap (vph)	343		2632		437	3319
v/s Ratio Prot	c0.16		0.20		0.01	c0.48
v/s Ratio Perm					0.03	
v/c Ratio	0.77		0.38		0.06	0.73
Uniform Delay, d1	52.5		19.9		16.4	16.1
Progression Factor	1.13		1.66		0.23	1.08
Incremental Delay, d2	10.3		0.3		0.0	0.1
Delay (s)	69.7		33.3		3.8	17.4
Level of Service	E		C		A	B
Approach Delay (s)	69.7		33.3			17.3
Approach LOS	E		C			B

Intersection Summary			
HCM 2000 Control Delay	26.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.7
Intersection Capacity Utilization	72.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

# Queues

## 107: Meridian Ave & Whiting St

01/19/2022



Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	316	996	26	2417
v/c Ratio	0.80	0.38	0.06	0.69
Control Delay	61.9	34.7	2.1	15.2
Queue Delay	1.0	0.0	0.0	16.4
Total Delay	62.9	34.8	2.1	31.7
Queue Length 50th (ft)	222	289	1	787
Queue Length 95th (ft)	291	m344	m2	m642
Internal Link Dist (ft)	878	712		229
Turn Bay Length (ft)				
Base Capacity (vph)	503	2635	461	3508
Starvation Cap Reductn	0	0	0	1146
Spillback Cap Reductn	55	238	0	365
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.71	0.42	0.06	1.02

### Intersection Summary

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

# HCS7 Two-Way Stop-Control Report

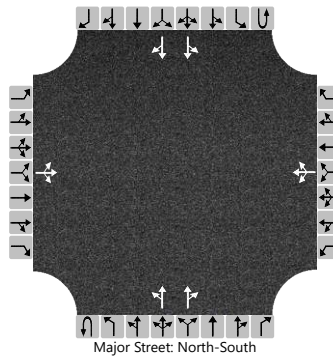
## General Information

Analyst	H.W. Lochner
Agency/Co.	
Date Performed	09/24/2021
Analysis Year	2036
Time Analyzed	AM Peak Hour
Intersection Orientation	North-South
Project Description	Whiting PD&E Study

## Site Information

Intersection	EWashingtonSt&JeffersonSt
Jurisdiction	FDOT, District 7
East/West Street	E Washington St
North/South Street	Jefferson St
Peak Hour Factor	0.95
Analysis Time Period (hrs)	1.00

## Lanes



## Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound				
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Movement																	
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6	
Number of Lanes		0	1	0		0	1	0	0	0	2	0	0	0	2	0	
Configuration			LTR				LTR			LT		TR		LT		TR	
Volume (veh/h)		1	34	154		71	58	203		43	459	5		29	711	135	
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2			
Proportion Time Blocked																	
Percent Grade (%)		0				0											
Right Turn Channelized																	
Median Type   Storage		Undivided															

## Critical and Follow-up Headways

Base Critical Headway (sec)		7.5	6.5	6.9		7.5	6.5	6.9		4.1				4.1		
Critical Headway (sec)		7.54	6.54	6.94		7.54	6.54	6.94		4.14				4.14		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.52	4.02	3.32		3.52	4.02	3.32		2.22				2.22		

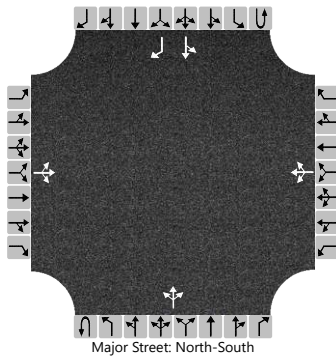
## Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			199				349				45				31		
Capacity, c (veh/h)			313				203				757				1071		
v/c Ratio			0.64				1.72				0.06				0.03		
95% Queue Length, Q <sub>95</sub> (veh)			4.8				79.6				0.2				0.1		
Control Delay (s/veh)			36.1				1356.2				10.1				8.5		
Level of Service (LOS)			E				F				B				A		
Approach Delay (s/veh)		36.1				1356.2				1.2				0.5			
Approach LOS		E				F											

# HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	H.W. Lochner	Intersection	EWashingtonSt&BrushSt
Agency/Co.		Jurisdiction	FDOT, District 7
Date Performed	09/24/2021	East/West Street	E Washington St
Analysis Year	2036	North/South Street	Brush St
Time Analyzed	AM Peak Hour	Peak Hour Factor	0.95
Intersection Orientation	North-South	Analysis Time Period (hrs)	1.00
Project Description	Whiting PD&E Study		

## Lanes



## Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound				
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Movement																	
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6	
Number of Lanes		0	1	0		0	1	0		0	1	0		0	1	1	
Configuration			LTR				LTR				LTR			LT		R	
Volume (veh/h)		26	9	43		31	4	1		112	175	28		5	381	172	
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2			
Proportion Time Blocked																	
Percent Grade (%)		0				0											
Right Turn Channelized																Yes	
Median Type   Storage		Undivided															

## Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.12	6.52	6.22		7.12	6.52	6.22		4.12				4.12		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.52	4.02	3.32		3.52	4.02	3.32		2.22				2.22		

## Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			82				38				118				5		
Capacity, c (veh/h)			381				203				1158				1356		
v/c Ratio			0.22				0.19				0.10				0.00		
95% Queue Length, Q <sub>95</sub> (veh)			0.8				0.7				0.3				0.0		
Control Delay (s/veh)			17.0				26.8				8.5				7.7		
Level of Service (LOS)			C				D				A				A		
Approach Delay (s/veh)		17.0				26.8				3.6				0.1			
Approach LOS		C				D											

# HCS7 Two-Way Stop-Control Report

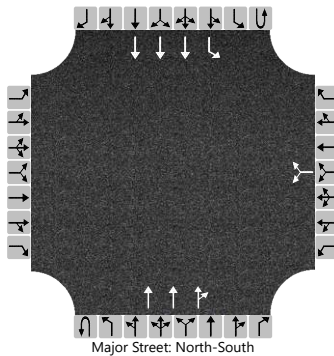
## General Information

Analyst	H.W. Lochner
Agency/Co.	
Date Performed	09/24/2021
Analysis Year	2036
Time Analyzed	AM Peak Hour
Intersection Orientation	North-South
Project Description	Whiting PD&E Study

## Site Information

Intersection	MeridianAve&EWashingtonSt
Jurisdiction	FDOT, District 7
East/West Street	Meridian Ave
North/South Street	E Washington St
Peak Hour Factor	0.95
Analysis Time Period (hrs)	1.00

## Lanes



## Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	3	0	0	1	3	0
Configuration							LR				T	TR		L	T	
Volume (veh/h)						156		156			984	171	0	5	2249	
Percent Heavy Vehicles (%)						2		2					0	2		
Proportion Time Blocked																
Percent Grade (%)							0									
Right Turn Channelized																
Median Type   Storage							Left Only									1

## Critical and Follow-up Headways




















Base Critical Headway (sec)						6.4		7.1							5.3	
Critical Headway (sec)						5.74		7.14							5.34	
Base Follow-Up Headway (sec)						3.8		3.9							3.1	
Follow-Up Headway (sec)						3.82		3.92							3.12	

## Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)								328							5	
Capacity, c (veh/h)								210							307	
v/c Ratio								1.56							0.02	
95% Queue Length, Q <sub>95</sub> (veh)								66.6							0.1	
Control Delay (s/veh)								1083.6							16.9	
Level of Service (LOS)								F							C	
Approach Delay (s/veh)								1083.6							0.0	
Approach LOS								F								

HCM Signalized Intersection Capacity Analysis  
 114: Florida Ave & Channelside Dr

01/19/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 						 				
Traffic Volume (vph)	1026	2117	221	0	0	0	0	533	135	0	0	0
Future Volume (vph)	1026	2117	221	0	0	0	0	533	135	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.1						6.0	6.0			
Lane Util. Factor	*0.51	*0.76						*0.80	1.00			
Frt	1.00	0.99						1.00	0.85			
Flt Protected	0.95	1.00						1.00	1.00			
Satd. Flow (prot)	1805	2791						2980	1583			
Flt Permitted	0.95	1.00						1.00	1.00			
Satd. Flow (perm)	1805	2791						2980	1583			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1115	2301	240	0	0	0	0	579	147	0	0	0
RTOR Reduction (vph)	188	4	0	0	0	0	0	0	62	0	0	0
Lane Group Flow (vph)	927	2537	0	0	0	0	0	579	85	0	0	0
Turn Type	Prot	NA						NA	Perm			
Protected Phases	1	6						4				
Permitted Phases									4			
Actuated Green, G (s)	64.0	102.9						25.0	25.0			
Effective Green, g (s)	64.0	102.9						25.0	25.0			
Actuated g/C Ratio	0.46	0.74						0.18	0.18			
Clearance Time (s)	6.0	6.1						6.0	6.0			
Vehicle Extension (s)	3.0	3.0						3.0	3.0			
Lane Grp Cap (vph)	825	2051						532	282			
v/s Ratio Prot	0.51	c0.91						c0.19				
v/s Ratio Perm									0.05			
v/c Ratio	1.12	1.24						1.09	0.30			
Uniform Delay, d1	38.0	18.5						57.5	49.9			
Progression Factor	1.00	1.00						1.00	1.00			
Incremental Delay, d2	71.0	111.0						65.2	0.6			
Delay (s)	109.0	129.5						122.7	50.5			
Level of Service	F	F						F	D			
Approach Delay (s)		123.3			0.0			108.1			0.0	
Approach LOS		F			A			F			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			120.7					HCM 2000 Level of Service		F		
HCM 2000 Volume to Capacity ratio			1.27									
Actuated Cycle Length (s)			140.0					Sum of lost time (s)		18.6		
Intersection Capacity Utilization			107.3%					ICU Level of Service		G		
Analysis Period (min)			15									

c Critical Lane Group



# Queues

## 114: Florida Ave & Channelside Dr

01/19/2022



Lane Group	EBL	EBT	NBT	NBR
Lane Group Flow (vph)	1115	2541	579	147
v/c Ratio	1.10	1.24	1.09	0.43
Control Delay	85.6	131.9	117.9	29.3
Queue Delay	0.5	0.0	4.7	0.0
Total Delay	86.0	131.9	122.5	29.3
Queue Length 50th (ft)	~950	~1886	~369	57
Queue Length 95th (ft)	#1212	#2043	#515	127
Internal Link Dist (ft)		1290	1157	
Turn Bay Length (ft)				200
Base Capacity (vph)	1013	2056	532	344
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	89	0	10	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.21	1.24	1.11	0.43

### Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis  
 115: Morgan St & Channelside Dr

01/19/2022

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	528	1666	58	12	0	796	0	177	31	1	26	0	
Future Volume (vph)	528	1666	58	12	0	796	0	177	31	1	26	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	5.5	6.2		5.9		5.9		5.9	5.9	5.9	5.9		
Lane Util. Factor	1.00	0.95		1.00		1.00		1.00	1.00	1.00	1.00		
Frt	1.00	0.99		1.00		0.85		1.00	0.85	1.00	1.00		
Flt Protected	0.95	1.00		0.95		1.00		1.00	1.00	0.95	1.00		
Satd. Flow (prot)	1770	3521		1770		1583		1863	1583	1770	1863		
Flt Permitted	0.95	1.00		0.10		1.00		1.00	1.00	0.43	1.00		
Satd. Flow (perm)	1770	3521		193		1583		1863	1583	795	1863		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	574	1811	63	13	0	865	0	192	34	1	28	0	
RTOR Reduction (vph)	0	2	0	0	0	157	0	0	28	0	0	0	
Lane Group Flow (vph)	574	1872	0	13	0	708	0	192	6	1	28	0	
Turn Type	pm+pt	NA		Perm		Perm		NA	Perm	Perm	NA		
Protected Phases	1	6						4				8	
Permitted Phases	6			2		2			4		8		
Actuated Green, G (s)	103.8	103.8		75.7		75.7		24.1	24.1	24.1	24.1		
Effective Green, g (s)	103.8	103.8		75.7		75.7		24.1	24.1	24.1	24.1		
Actuated g/C Ratio	0.74	0.74		0.54		0.54		0.17	0.17	0.17	0.17		
Clearance Time (s)	5.5	6.2		5.9		5.9		5.9	5.9	5.9	5.9		
Vehicle Extension (s)	3.0	3.0		3.0		3.0		3.0	3.0	3.0	3.0		
Lane Grp Cap (vph)	1312	2610		104		855		320	272	136	320		
v/s Ratio Prot	0.07	c0.53						c0.10			0.02		
v/s Ratio Perm	0.25			0.07		c0.45			0.00	0.00			
v/c Ratio	0.44	0.72		0.12		0.83		0.60	0.02	0.01	0.09		
Uniform Delay, d1	6.9	10.0		15.8		26.7		53.5	48.2	48.0	48.7		
Progression Factor	0.47	0.36		0.93		1.03		1.00	1.00	1.35	1.16		
Incremental Delay, d2	0.0	0.2		1.9		7.3		8.1	0.1	0.0	0.2		
Delay (s)	3.3	3.7		16.7		35.0		61.6	48.3	65.0	56.5		
Level of Service	A	A		B		C		E	D	E	E		
Approach Delay (s)		3.6			34.7			59.6			56.8		
Approach LOS		A			C			E			E		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			15.2									HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.78										
Actuated Cycle Length (s)			140.0									Sum of lost time (s)	17.3
Intersection Capacity Utilization			102.3%									ICU Level of Service	G
Analysis Period (min)			15										

c Critical Lane Group

Queues

115: Morgan St & Channelside Dr

01/19/2022



Lane Group	EBL	EBT	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	574	1874	13	865	192	34	1	28
v/c Ratio	0.43	0.72	0.12	0.85	0.60	0.10	0.01	0.09
Control Delay	3.3	3.8	20.2	25.2	62.2	1.7	65.0	57.0
Queue Delay	1.4	6.0	0.0	3.5	0.8	0.0	0.0	0.0
Total Delay	4.7	9.8	20.2	28.7	63.0	1.7	65.0	57.0
Queue Length 50th (ft)	62	113	5	284	163	0	1	18
Queue Length 95th (ft)	m55	m98	m9	#403	248	5	m1	m20
Internal Link Dist (ft)		523			1253			424
Turn Bay Length (ft)	450			10			100	
Base Capacity (vph)	1321	2613	104	1012	320	328	136	320
Starvation Cap Reductn	518	687	0	68	0	0	0	0
Spillback Cap Reductn	82	236	0	83	23	4	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.97	0.13	0.93	0.65	0.10	0.01	0.09

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.

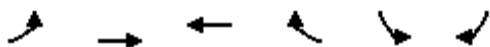
Queue shown is maximum after two cycles.

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

# HCM 6th Signalized Intersection Summary

## 116: Channelside Dr & Jefferson St

01/19/2022

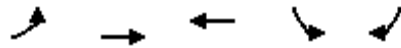


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	136	1562	528	14	7	279
Future Volume (veh/h)	136	1562	528	14	7	279
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	148	1698	574	15	8	303
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	716	1443	933	24	261	232
Arrive On Green	0.07	0.25	0.68	0.68	0.15	0.15
Sat Flow, veh/h	1781	1870	1814	47	1781	1585
Grp Volume(v), veh/h	148	1698	0	589	8	303
Grp Sat Flow(s),veh/h/ln	1781	1870	0	1862	1781	1585
Q Serve(g_s), s	3.6	108.0	0.0	24.2	0.5	20.5
Cycle Q Clear(g_c), s	3.6	108.0	0.0	24.2	0.5	20.5
Prop In Lane	1.00			0.03	1.00	1.00
Lane Grp Cap(c), veh/h	716	1443	0	958	261	232
V/C Ratio(X)	0.21	1.18	0.00	0.62	0.03	1.31
Avail Cap(c_a), veh/h	716	1443	0	958	261	232
HCM Platoon Ratio	0.33	0.33	1.33	1.33	1.00	1.00
Upstream Filter(I)	0.64	0.64	0.00	0.88	0.95	0.95
Uniform Delay (d), s/veh	9.7	52.2	0.0	14.6	51.2	59.8
Incr Delay (d2), s/veh	0.4	84.6	0.0	2.6	0.2	163.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	88.2	0.0	9.3	0.3	18.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	10.1	136.8	0.0	17.2	51.4	223.6
LnGrp LOS	B	F	A	B	D	F
Approach Vol, veh/h		1846	589		311	
Approach Delay, s/veh		126.6	17.2		219.2	
Approach LOS		F	B		F	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	36.0	78.0			114.0	26.0
Change Period (Y+Rc), s	6.0	6.0			6.0	5.5
Max Green Setting (Gmax), s	30.0	72.0			108.0	20.5
Max Q Clear Time (g_c+I1), s	5.6	26.2			110.0	22.5
Green Ext Time (p_c), s	0.4	4.6			0.0	0.0
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			113.6			
HCM 6th LOS			F			

# Queues

## 116: Channelside Dr & Jefferson St

01/19/2022



Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	148	1698	589	8	303
v/c Ratio	0.23	1.18	0.62	0.03	0.62
Control Delay	1.5	105.0	23.7	50.0	28.2
Queue Delay	0.0	0.5	1.0	0.0	1.1
Total Delay	1.5	105.5	24.7	50.0	29.3
Queue Length 50th (ft)	12	~1904	440	7	138
Queue Length 95th (ft)	m15	#2177	585	m21	203
Internal Link Dist (ft)		315	131	443	
Turn Bay Length (ft)				100	
Base Capacity (vph)	643	1437	955	259	490
Starvation Cap Reductn	0	182	155	0	56
Spillback Cap Reductn	0	110	67	0	48
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.23	1.35	0.74	0.03	0.70

### Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

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

HCM 6th Signalized Intersection Summary  
 117: Channelside Dr & Nebraska Ave

01/19/2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↑	↗		↙	↘
Traffic Volume (veh/h)	338	1231	488	73	8	54
Future Volume (veh/h)	338	1231	488	73	8	54
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	367	1338	530	79	9	59
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	683	1483	1136	169	26	172
Arrive On Green	0.07	1.00	1.00	1.00	0.13	0.13
Sat Flow, veh/h	1781	1870	1591	237	210	1378
Grp Volume(v), veh/h	367	1338	0	609	69	0
Grp Sat Flow(s),veh/h/ln	1781	1870	0	1828	1612	0
Q Serve(g_s), s	0.0	0.0	0.0	0.0	5.5	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	5.5	0.0
Prop In Lane	1.00			0.13	0.13	0.86
Lane Grp Cap(c), veh/h	683	1483	0	1305	201	0
V/C Ratio(X)	0.54	0.90	0.00	0.47	0.34	0.00
Avail Cap(c_a), veh/h	683	1483	0	1305	201	0
HCM Platoon Ratio	2.00	2.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.09	0.09	0.00	0.87	0.15	0.00
Uniform Delay (d), s/veh	8.3	0.0	0.0	0.0	56.0	0.0
Incr Delay (d2), s/veh	0.3	1.0	0.0	1.0	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.4	0.4	0.0	0.4	2.3	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	8.6	1.0	0.0	1.0	56.7	0.0
LnGrp LOS	A	A	A	A	E	A
Approach Vol, veh/h		1705	609		69	
Approach Delay, s/veh		2.6	1.0		56.7	
Approach LOS		A	A		E	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	11.0	106.0			117.0	23.0
Change Period (Y+Rc), s	6.0	6.0			6.0	5.5
Max Green Setting (Gmax), s	5.0	100.0			111.0	17.5
Max Q Clear Time (g_c+I1), s	2.0	2.0			2.0	7.5
Green Ext Time (p_c), s	0.4	4.5			25.1	0.1
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			3.8			
HCM 6th LOS			A			

# Queues

## 117: Channelside Dr & Nebraska Ave

01/19/2022



Lane Group	EBL	EBT	WBT	SBL
Lane Group Flow (vph)	367	1338	609	68
v/c Ratio	0.62	0.91	0.46	0.27
Control Delay	2.2	7.5	9.2	20.8
Queue Delay	36.6	46.7	0.5	0.1
Total Delay	38.8	54.2	9.7	20.9
Queue Length 50th (ft)	11	433	142	9
Queue Length 95th (ft)	m9	m122	245	m22
Internal Link Dist (ft)		131	222	457
Turn Bay Length (ft)	80			
Base Capacity (vph)	592	1477	1310	255
Starvation Cap Reductn	240	400	321	0
Spillback Cap Reductn	0	170	327	10
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.04	1.24	0.62	0.28

### Intersection Summary

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

HCM 6th Signalized Intersection Summary  
119: Old Water St & Channelside Dr

01/19/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	1165	50	9	406	131	95	31	94	44	13	60
Future Volume (veh/h)	24	1165	50	9	406	131	95	31	94	44	13	60
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	26	1266	54	10	441	142	103	34	102	48	14	65
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	623	1227	52	338	1099	354	185	60	179	137	42	194
Arrive On Green	0.07	1.00	1.00	0.31	1.00	1.00	0.14	0.14	0.14	0.14	0.14	0.14
Sat Flow, veh/h	1781	1781	76	1781	1355	436	1320	412	1236	1253	289	1340
Grp Volume(v), veh/h	26	0	1320	10	0	583	103	0	136	48	0	79
Grp Sat Flow(s),veh/h/ln	1781	0	1857	1781	0	1792	1320	0	1648	1253	0	1629
Q Serve(g_s), s	0.7	0.0	90.2	0.0	0.0	0.0	10.6	0.0	10.8	5.2	0.0	6.1
Cycle Q Clear(g_c), s	0.7	0.0	90.2	0.0	0.0	0.0	16.7	0.0	10.8	16.0	0.0	6.1
Prop In Lane	1.00		0.04	1.00		0.24	1.00		0.75	1.00		0.82
Lane Grp Cap(c), veh/h	623	0	1280	338	0	1453	185	0	239	137	0	236
V/C Ratio(X)	0.04	0.00	1.03	0.03	0.00	0.40	0.56	0.00	0.57	0.35	0.00	0.33
Avail Cap(c_a), veh/h	623	0	1280	338	0	1453	185	0	239	137	0	236
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.36	0.00	0.36	0.17	0.00	0.17	1.00	0.00	1.00	0.78	0.00	0.78
Uniform Delay (d), s/veh	7.9	0.0	0.0	38.9	0.0	0.0	61.3	0.0	55.8	63.2	0.0	53.8
Incr Delay (d2), s/veh	0.0	0.0	24.0	0.0	0.0	0.1	11.5	0.0	9.5	5.4	0.0	3.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	8.5	0.2	0.0	0.1	4.2	0.0	5.2	1.9	0.0	2.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.9	0.0	24.0	38.9	0.0	0.1	72.8	0.0	65.3	68.7	0.0	56.7
LnGrp LOS	A	A	F	D	A	A	E	A	E	E	A	E
Approach Vol, veh/h		1346			593			239				127
Approach Delay, s/veh		23.6			0.8			68.5				61.2
Approach LOS		C			A			E				E
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.0	120.5		26.0	28.5	103.0		26.0				
Change Period (Y+Rc), s	6.0	6.5		* 5.7	6.5	* 6.5		* 5.7				
Max Green Setting (Gmax), s	5.0	96.5		* 20	5.0	* 97		* 20				
Max Q Clear Time (g_c+I1), s	2.7	2.0		18.7	2.0	92.2		18.0				
Green Ext Time (p_c), s	0.0	4.8		0.2	0.0	3.6		0.1				

Intersection Summary

HCM 6th Ctrl Delay	24.5
HCM 6th LOS	C

Notes

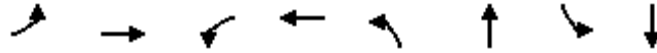
\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Queues

119: Old Water St & Channelside Dr

01/19/2022



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	26	1320	10	583	103	136	48	79
v/c Ratio	0.05	1.03	0.09	0.47	0.54	0.43	0.33	0.27
Control Delay	7.0	38.8	18.6	17.7	67.1	25.0	65.4	23.6
Queue Delay	0.0	27.1	0.0	4.2	0.8	0.2	0.0	0.1
Total Delay	7.0	65.9	18.6	21.9	67.9	25.2	65.4	23.8
Queue Length 50th (ft)	4	~1274	4	321	88	37	36	12
Queue Length 95th (ft)	m7	m#1539	m7	m327	153	104	m56	m31
Internal Link Dist (ft)		222		393		1129		462
Turn Bay Length (ft)	80		100				150	
Base Capacity (vph)	487	1277	115	1244	190	316	144	292
Starvation Cap Reductn	0	9	0	566	0	0	0	0
Spillback Cap Reductn	0	344	0	29	12	16	0	18
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	1.41	0.09	0.86	0.58	0.45	0.33	0.29

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis  
 118: Beneficial Dr/Meridian Ave & Channelside Dr

01/19/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	677	604	21	103	208	117	235	398	104	87	335	103
Future Volume (vph)	677	604	21	103	208	117	235	398	104	87	335	103
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.2		6.2	6.2		6.4	6.4	6.4	6.4	6.4	6.4
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1853		1770	1762		1770	1863	1583	1770	1863	1583
Flt Permitted	0.25	1.00		0.41	1.00		0.16	1.00	1.00	0.33	1.00	1.00
Satd. Flow (perm)	464	1853		757	1762		306	1863	1583	606	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	736	657	23	112	226	127	255	433	113	95	364	112
RTOR Reduction (vph)	0	1	0	0	14	0	0	0	74	0	0	86
Lane Group Flow (vph)	736	679	0	112	339	0	255	433	39	95	364	26
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	1	6			2		7	4			8	
Permitted Phases	6			2			4		4	8		8
Actuated Green, G (s)	82.8	82.8		38.8	38.8		44.6	44.6	44.6	32.6	32.6	32.6
Effective Green, g (s)	82.8	82.8		38.8	38.8		44.6	44.6	44.6	32.6	32.6	32.6
Actuated g/C Ratio	0.59	0.59		0.28	0.28		0.32	0.32	0.32	0.23	0.23	0.23
Clearance Time (s)	6.0	6.2		6.2	6.2		6.4	6.4	6.4	6.4	6.4	6.4
Vehicle Extension (s)	2.0	3.0		3.0	3.0		2.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	628	1095		209	488		156	593	504	141	433	368
v/s Ratio Prot	c0.32	0.37			0.19		c0.07	0.23			0.20	
v/s Ratio Perm	c0.37			0.15			c0.46		0.02	0.16		0.02
v/c Ratio	1.17	0.62		0.54	0.69		1.63	0.73	0.08	0.67	0.84	0.07
Uniform Delay, d1	30.5	18.5		43.0	45.3		47.8	42.4	33.3	48.9	51.2	41.9
Progression Factor	0.98	0.40		1.00	1.00		1.00	1.00	1.00	1.10	1.11	4.32
Incremental Delay, d2	82.7	0.8		9.5	7.9		312.7	7.7	0.3	21.8	16.9	0.4
Delay (s)	112.7	8.2		52.5	53.2		360.5	50.1	33.6	75.7	73.8	181.5
Level of Service	F	A		D	D		F	D	C	E	E	F
Approach Delay (s)		62.5			53.0			146.6			95.3	
Approach LOS		E			D			F			F	

Intersection Summary		
HCM 2000 Control Delay	87.6	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	1.40	F
Actuated Cycle Length (s)	140.0	Sum of lost time (s)
Intersection Capacity Utilization	107.1%	25.0
Analysis Period (min)	15	ICU Level of Service
		G

c Critical Lane Group

Queues

118: Beneficial Dr/Meridian Ave & Channelside Dr

01/19/2022



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	736	680	112	353	255	433	113	95	364	112
v/c Ratio	1.17	0.62	0.54	0.70	1.65	0.73	0.20	0.67	0.84	0.24
Control Delay	109.1	8.3	54.0	51.4	346.6	50.8	7.5	77.4	74.1	26.5
Queue Delay	0.5	7.3	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.1
Total Delay	109.6	15.6	54.0	51.5	347.7	50.8	7.5	77.4	74.1	26.7
Queue Length 50th (ft)	~648	193	87	274	~291	350	3	89	346	26
Queue Length 95th (ft)	m#632	m201	156	391	#489	479	48	#169	#493	104
Internal Link Dist (ft)		393		142		1114			460	
Turn Bay Length (ft)	150		150		300			200		
Base Capacity (vph)	629	1096	209	502	155	593	577	141	433	462
Starvation Cap Reductn	42	367	0	0	0	0	0	0	0	0
Spillback Cap Reductn	36	0	0	1	9	0	0	0	0	54
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.25	0.93	0.54	0.70	1.75	0.73	0.20	0.67	0.84	0.27

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

# HCS7 Two-Way Stop-Control Report

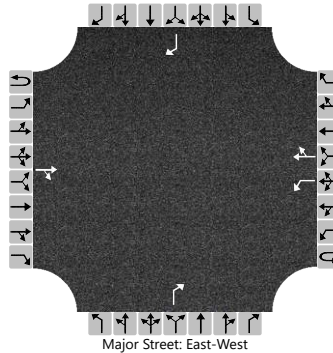
## General Information

Analyst	H.W. Lochner
Agency/Co.	
Date Performed	09/24/2021
Analysis Year	2036
Time Analyzed	PM Peak Hour
Intersection Orientation	East-West
Project Description	Whiting PD&E Study

## Site Information

Intersection	ChannelsideDr&12thSt
Jurisdiction	FDOT, District 7
East/West Street	Channelside Dr
North/South Street	12th St
Peak Hour Factor	0.95
Analysis Time Period (hrs)	1.00

## Lanes



## Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	1	0	0	1	1	0		0	0	1		0	0	1
Configuration				TR		L		TR				R				R
Volume (veh/h)			686	109		12	311	25				124				117
Percent Heavy Vehicles (%)						2						2				2
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized										No				No		
Median Type   Storage	Undivided															

## Critical and Follow-up Headways

Base Critical Headway (sec)					4.1							6.2				6.2
Critical Headway (sec)					4.12							6.22				6.22
Base Follow-Up Headway (sec)					2.2							3.3				3.3
Follow-Up Headway (sec)					2.22							3.32				3.32

## Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)					13							131				123		
Capacity, c (veh/h)					797							396				702		
v/c Ratio					0.02							0.33				0.18		
95% Queue Length, Q <sub>95</sub> (veh)					0.0							1.5				0.6		
Control Delay (s/veh)					9.6							18.6				11.2		
Level of Service (LOS)					A							C				B		
Approach Delay (s/veh)					0.3						18.6				11.2			
Approach LOS					C						C				B			

# MOVEMENT SUMMARY

**Site: 8 [Channelside Drive at Cumberland Avenue\_Build2036-PM (Site Folder: General)]**

Build 2036 Year -  
 PM Peak Hour  
 Site Category: (None)  
 Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
		[ Total veh/h ]	[ HV % ]	[ Total veh/h ]	[ HV % ]				[ Veh. veh ]	[ Dist ft ]				
South: Channelside Drive														
3	L2	123	2.0	129	2.0	0.702	12.9	LOS B	6.3	160.8	0.57	0.36	0.57	33.9
8	T1	679	2.0	715	2.0	0.702	12.9	LOS B	6.3	160.8	0.57	0.36	0.57	34.5
18	R2	25	2.0	26	2.0	0.702	12.9	LOS B	6.3	160.8	0.57	0.36	0.57	33.5
Approach		827	2.0	871	2.0	0.702	12.9	LOS B	6.3	160.8	0.57	0.36	0.57	34.4
East: E Cumberland Avenue														
1	L2	39	2.0	41	2.0	0.143	7.3	LOS A	0.5	12.6	0.60	0.60	0.60	36.8
6	T1	5	2.0	5	2.0	0.143	7.3	LOS A	0.5	12.6	0.60	0.60	0.60	34.3
16	R2	43	2.0	45	2.0	0.143	7.3	LOS A	0.5	12.6	0.60	0.60	0.60	34.2
Approach		87	2.0	92	2.0	0.143	7.3	LOS A	0.5	12.6	0.60	0.60	0.60	35.3
North: Channelside Drive														
7	L2	30	2.0	32	2.0	0.297	5.8	LOS A	1.4	35.0	0.34	0.22	0.34	37.6
4	T1	307	2.0	323	2.0	0.297	5.8	LOS A	1.4	35.0	0.34	0.22	0.34	39.3
14	R2	273	2.0	287	2.0	0.256	5.6	LOS A	1.2	29.5	0.35	0.23	0.35	34.1
Approach		610	2.0	642	2.0	0.297	5.7	LOS A	1.4	35.0	0.35	0.22	0.35	36.8
West: E Cumberland Avenue														
5	L2	46	2.0	48	2.0	0.144	5.0	LOS A	0.5	13.9	0.44	0.36	0.44	35.0
2	T1	50	2.0	53	2.0	0.144	5.0	LOS A	0.5	13.9	0.44	0.36	0.44	34.7
12	R2	39	2.0	41	2.0	0.144	5.0	LOS A	0.5	13.9	0.44	0.36	0.44	33.6
Approach		135	2.0	142	2.0	0.144	5.0	LOS A	0.5	13.9	0.44	0.36	0.44	34.5
All Vehicles		1659	2.0	1746	2.0	0.702	9.3	LOS A	6.3	160.8	0.48	0.32	0.48	35.3

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# HCS7 Two-Way Stop-Control Report

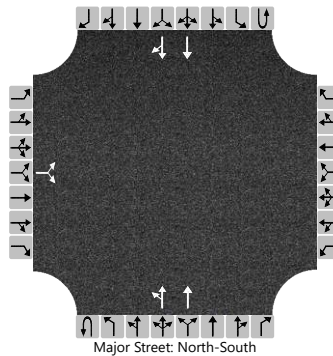
## General Information

Analyst	H.W. Lochner
Agency/Co.	
Date Performed	09/24/2021
Analysis Year	2036
Time Analyzed	PM Peak Hour
Intersection Orientation	North-South
Project Description	Whiting PD&E Study

## Site Information

Intersection	ChannelsideDr&E WhitingSt
Jurisdiction	FDOT, District 7
East/West Street	E Whiting St
North/South Street	Channelside Dr
Peak Hour Factor	0.95
Analysis Time Period (hrs)	1.00

## Lanes



## Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound				
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Movement																	
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6	
Number of Lanes		0	1	0		0	0	0		0	2	0		0	2	0	
Configuration			LR							LT	T				T	TR	
Volume (veh/h)		7		1						18	750				608	42	
Percent Heavy Vehicles (%)		2		2						2							
Proportion Time Blocked																	
Percent Grade (%)		0															
Right Turn Channelized																	
Median Type   Storage		Undivided															

## Critical and Follow-up Headways

Base Critical Headway (sec)		7.5		6.9						4.1						
Critical Headway (sec)		6.84		6.94						4.14						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.52		3.32						2.22						

## Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			8							19								
Capacity, c (veh/h)			219							905								
v/c Ratio			0.04							0.02								
95% Queue Length, Q <sub>95</sub> (veh)			0.1							0.1								
Control Delay (s/veh)			22.1							9.1								
Level of Service (LOS)			C							A								
Approach Delay (s/veh)		22.1									0.4							
Approach LOS		C																

HCM Signalized Intersection Capacity Analysis  
 130: Channelside Dr & E Washington St/E York St

01/19/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↗	↖	↕		↖	↕	
Traffic Volume (vph)	18	9	5	16	6	132	5	756	2	69	622	16
Future Volume (vph)	18	9	5	16	6	132	5	756	2	69	622	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.9			8.4	8.4	6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frt		0.98			1.00	0.85	1.00	1.00		1.00	1.00	
Flt Protected		0.97			0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1776			1799	1583	1770	3538		1770	3526	
Flt Permitted		0.23			0.77	1.00	0.39	1.00		0.95	1.00	
Satd. Flow (perm)		422			1430	1583	723	3538		1770	3526	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	20	10	5	17	7	143	5	822	2	75	676	17
RTOR Reduction (vph)	0	5	0	0	0	134	0	0	0	0	1	0
Lane Group Flow (vph)	0	30	0	0	24	9	5	824	0	75	692	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Prot	NA	
Protected Phases		4			3			2		1	1	2
Permitted Phases	4			3		3	2					
Actuated Green, G (s)		13.6			9.3	9.3	75.9	75.9		14.9	96.8	
Effective Green, g (s)		13.6			9.3	9.3	75.9	75.9		14.9	96.8	
Actuated g/C Ratio		0.10			0.07	0.07	0.54	0.54		0.11	0.69	
Clearance Time (s)		5.9			8.4	8.4	6.0	6.0		6.0		
Vehicle Extension (s)		2.0			4.0	4.0	3.0	3.0		2.0		
Lane Grp Cap (vph)		40			94	105	391	1918		188	2437	
v/s Ratio Prot								c0.23		c0.04	0.20	
v/s Ratio Perm		c0.07			c0.02	0.01	0.01					
v/c Ratio		0.76			0.26	0.09	0.01	0.43		0.40	0.28	
Uniform Delay, d1		61.6			62.1	61.4	14.8	19.1		58.4	8.3	
Progression Factor		0.93			1.00	1.00	1.00	1.00		0.94	1.65	
Incremental Delay, d2		47.1			2.0	0.5	0.1	0.7		0.5	0.0	
Delay (s)		104.3			64.0	61.9	14.8	19.8		55.5	13.7	
Level of Service		F			E	E	B	B		E	B	
Approach Delay (s)		104.3			62.2			19.8			17.8	
Approach LOS		F			E			B			B	

Intersection Summary

HCM 2000 Control Delay	24.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.3
Intersection Capacity Utilization	50.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Queues

130: Channelside Dr & E Washington St/E York St

01/19/2022



Lane Group	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	35	24	143	5	824	75	693
v/c Ratio	0.73	0.26	0.60	0.01	0.42	0.40	0.28
Control Delay	107.4	67.5	20.1	21.8	22.2	59.6	15.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	107.4	67.5	20.1	21.8	22.2	59.6	15.8
Queue Length 50th (ft)	28	21	0	2	235	72	132
Queue Length 95th (ft)	m47	51	67	12	354	127	213
Internal Link Dist (ft)	927	832			494		591
Turn Bay Length (ft)			430	160		280	
Base Capacity (vph)	73	220	365	398	1949	191	2444
Starvation Cap Reductn	0	0	0	0	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	0.48	0.11	0.39	0.01	0.42	0.39	0.28























Intersection Summary

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



HCM Signalized Intersection Capacity Analysis  
 129: Channelside Dr & Kennedy Blvd

01/19/2022

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	819	19	74	19	28	60	79	825	2	27	591	480	
Future Volume (vph)	819	19	74	19	28	60	79	825	2	27	591	480	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	6.3	6.3	6.3		6.8	6.8	6.3	6.3		6.3	6.3	6.3	
Lane Util. Factor	0.95	0.95	1.00		1.00	1.00	1.00	0.95		1.00	0.95	1.00	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	1.00		1.00	1.00	0.85	
Flt Protected	0.95	0.95	1.00		0.98	1.00	0.95	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	1681	1689	1583		1825	1583	1770	3538		1770	3539	1583	
Flt Permitted	0.95	0.95	1.00		0.66	1.00	0.26	1.00		0.12	1.00	1.00	
Satd. Flow (perm)	1681	1689	1583		1228	1583	489	3538		219	3539	1583	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	890	21	80	21	30	65	86	897	2	29	642	522	
RTOR Reduction (vph)	0	0	49	0	0	60	0	0	0	0	0	357	
Lane Group Flow (vph)	454	457	31	0	51	5	86	899	0	29	642	165	
Turn Type	Split	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm	
Protected Phases	3	3			1			2			2		
Permitted Phases			3	1		1	2			2		2	
Actuated Green, G (s)	54.7	54.7	54.7		9.7	9.7	44.3	44.3		44.3	44.3	44.3	
Effective Green, g (s)	54.7	54.7	54.7		9.7	9.7	44.3	44.3		44.3	44.3	44.3	
Actuated g/C Ratio	0.39	0.39	0.39		0.07	0.07	0.32	0.32		0.32	0.32	0.32	
Clearance Time (s)	6.3	6.3	6.3		6.8	6.8	6.3	6.3		6.3	6.3	6.3	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	656	659	618		85	109	154	1119		69	1119	500	
v/s Ratio Prot	0.27	c0.27						c0.25				0.18	
v/s Ratio Perm			0.02		c0.04	0.00	0.18			0.13		0.10	
v/c Ratio	0.69	0.69	0.05		0.60	0.04	0.56	0.80		0.42	0.57	0.33	
Uniform Delay, d1	35.6	35.6	26.5		63.3	60.8	39.7	43.9		37.7	40.0	36.5	
Progression Factor	1.00	1.00	1.00		1.00	1.00	0.54	0.62		1.00	1.00	1.00	
Incremental Delay, d2	5.9	5.9	0.2		10.9	0.2	12.8	5.7		17.7	2.1	1.8	
Delay (s)	41.5	41.6	26.7		74.2	61.0	34.4	32.8		55.4	42.1	38.3	
Level of Service	D	D	C		E	E	C	C		E	D	D	
Approach Delay (s)		40.3			66.8			32.9			40.8		
Approach LOS		D			E			C			D		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			39.2		HCM 2000 Level of Service						D		
HCM 2000 Volume to Capacity ratio			0.67										
Actuated Cycle Length (s)			140.0		Sum of lost time (s)						22.4		
Intersection Capacity Utilization			81.0%		ICU Level of Service						D		
Analysis Period (min)			15										

c Critical Lane Group

Queues

129: Channelside Dr & Kennedy Blvd

01/19/2022



Lane Group	EBL	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	454	457	80	51	65	86	899	29	642	522
v/c Ratio	0.69	0.69	0.12	0.54	0.31	0.54	0.78	0.41	0.56	0.60
Control Delay	42.3	42.3	2.9	81.3	7.0	33.8	31.3	57.1	41.0	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.3	42.3	2.9	81.3	7.0	33.8	31.3	57.1	41.0	6.0
Queue Length 50th (ft)	361	363	0	45	0	64	391	21	253	0
Queue Length 95th (ft)	498	502	21	90	18	130	477	59	316	88
Internal Link Dist (ft)		906		876			591		1242	
Turn Bay Length (ft)			140			280		75		375
Base Capacity (vph)	656	659	680	133	259	159	1155	71	1155	868
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.69	0.12	0.38	0.25	0.54	0.78	0.41	0.56	0.60

Intersection Summary

# HCM Signalized Intersection Capacity Analysis

## 113: Florida Ave & Selmon Expy Off-Ramp

01/19/2022



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↑↑↑	↑↑			
Traffic Volume (vph)	0	597	1590	0	0	0
Future Volume (vph)	0	597	1590	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.6	6.0			
Lane Util. Factor		0.76	0.95			
Frt		0.85	1.00			
Flt Protected		1.00	1.00			
Satd. Flow (prot)		3610	3539			
Flt Permitted		1.00	1.00			
Satd. Flow (perm)		3610	3539			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	649	1728	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	649	1728	0	0	0
Turn Type		Prot	NA			
Protected Phases		2	1 4			
Permitted Phases						
Actuated Green, G (s)		32.4	95.0			
Effective Green, g (s)		32.4	95.0			
Actuated g/C Ratio		0.23	0.68			
Clearance Time (s)		6.6				
Vehicle Extension (s)		3.0				
Lane Grp Cap (vph)		835	2401			
v/s Ratio Prot		c0.18	c0.49			
v/s Ratio Perm						
v/c Ratio		0.78	0.72			
Uniform Delay, d1		50.4	14.1			
Progression Factor		1.00	0.33			
Incremental Delay, d2		7.0	0.1			
Delay (s)		57.4	4.8			
Level of Service		E	A			
Approach Delay (s)	57.4		4.8		0.0	
Approach LOS	E		A		A	

### Intersection Summary

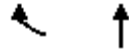
HCM 2000 Control Delay	19.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	109.8%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

# Queues

## 113: Florida Ave & Selmon Expy Off-Ramp

01/19/2022


















Lane Group	WBR	NBT
Lane Group Flow (vph)	649	1728
v/c Ratio	0.78	0.72
Control Delay	57.8	5.0
Queue Delay	0.0	0.0
Total Delay	57.8	5.0
Queue Length 50th (ft)	244	77
Queue Length 95th (ft)	306	m70
Internal Link Dist (ft)		1
Turn Bay Length (ft)	350	
Base Capacity (vph)	835	2401
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.78	0.72

### Intersection Summary

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

HCM Signalized Intersection Capacity Analysis  
 109: Florida Ave & Brorein St

01/19/2022

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	0	0	0	0	2163	31	248	1995	0	0	0	0	
Future Volume (vph)	0	0	0	0	2163	31	248	1995	0	0	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)					5.8		6.1	6.1					
Lane Util. Factor					0.86		1.00	0.91					
Fr <sub>t</sub>					1.00		1.00	1.00					
Fl <sub>t</sub> Protected					1.00		0.95	1.00					
Satd. Flow (prot)					6394		1770	5085					
Fl <sub>t</sub> Permitted					1.00		0.95	1.00					
Satd. Flow (perm)					6394		1770	5085					
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	0	0	0	0	2351	34	270	2168	0	0	0	0	
RTOR Reduction (vph)	0	0	0	0	1	0	22	0	0	0	0	0	
Lane Group Flow (vph)	0	0	0	0	2384	0	248	2168	0	0	0	0	
Turn Type					NA		Perm	NA					
Protected Phases					2			4					
Permitted Phases							4						
Actuated Green, G (s)					54.2		73.9	73.9					
Effective Green, g (s)					54.2		73.9	73.9					
Actuated g/C Ratio					0.37		0.51	0.51					
Clearance Time (s)					5.8		6.1	6.1					
Vehicle Extension (s)					3.0		3.0	3.0					
Lane Grp Cap (vph)					2390		902	2591					
v/s Ratio Prot					c0.37			c0.43					
v/s Ratio Perm							0.14						
v/c Ratio					1.00		0.28	0.84					
Uniform Delay, d <sub>1</sub>					45.3		20.3	30.4					
Progression Factor					1.00		1.00	1.00					
Incremental Delay, d <sub>2</sub>					17.8		0.8	3.4					
Delay (s)					63.1		21.0	33.8					
Level of Service					E		C	C					
Approach Delay (s)		0.0			63.1			32.4			0.0		
Approach LOS		A			E			C			A		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			47.6		HCM 2000 Level of Service				D				
HCM 2000 Volume to Capacity ratio			0.89										
Actuated Cycle Length (s)			145.0		Sum of lost time (s)				14.9				
Intersection Capacity Utilization			80.3%		ICU Level of Service				D				
Analysis Period (min)			15										
c Critical Lane Group													

# Queues

## 109: Florida Ave & Brorein St

01/19/2022



Lane Group	WBT	NBL	NBT
Lane Group Flow (vph)	2385	270	2168
v/c Ratio	1.00	0.29	0.84
Control Delay	62.8	17.9	34.1
Queue Delay	0.0	1.4	47.1
Total Delay	62.8	19.2	81.3
Queue Length 50th (ft)	650	118	626
Queue Length 95th (ft)	#747	180	692
Internal Link Dist (ft)	416		356
Turn Bay Length (ft)		300	
Base Capacity (vph)	2391	923	2591
Starvation Cap Reductn	0	458	859
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	1.00	0.58	1.25

### Intersection Summary

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

# HCM Signalized Intersection Capacity Analysis

## 110: Morgan St & Brorein St & Selmon Expy Off-Ramp

01/19/2022



Movement	WBL	WBT	NBL	NBT	NBR2	SBL	SBT	SBR	SWR	SWR2
Lane Configurations		↔↔	↔	↑	↔	↔	↔		↔	↔
Traffic Volume (vph)	3	1425	546	490	480	416	21	639	785	163
Future Volume (vph)	3	1425	546	490	480	416	21	639	785	163
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.7	5.5	6.0	6.0	5.5	6.0		5.7	5.7
Lane Util. Factor		0.95	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt		1.00	1.00	1.00	0.85	1.00	0.85		1.00	0.85
Flt Protected		1.00	0.95	1.00	1.00	0.95	1.00		1.00	1.00
Satd. Flow (prot)		3539	1770	1863	1583	1770	1592		1863	1583
Flt Permitted		1.00	0.11	1.00	1.00	0.34	1.00		1.00	1.00
Satd. Flow (perm)		3539	206	1863	1583	631	1592		1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	3	1549	593	533	522	452	23	695	853	177
RTOR Reduction (vph)	0	0	0	0	36	0	1	0	0	73
Lane Group Flow (vph)	0	1552	593	533	487	452	717	0	853	104
Turn Type	Perm	NA	pm+pt	NA	Perm	pm+pt	NA		Prot	Perm
Protected Phases		2!	7	4		3	8		2!	
Permitted Phases	2		4		4	8				2
Actuated Green, G (s)		46.3	82.0	70.0	70.0	70.5	64.0		46.3	46.3
Effective Green, g (s)		46.3	82.0	70.0	70.0	70.5	64.0		46.3	46.3
Actuated g/C Ratio		0.33	0.59	0.50	0.50	0.50	0.46		0.33	0.33
Clearance Time (s)		5.7	5.5	6.0	6.0	5.5	6.0		5.7	5.7
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		1170	260	931	791	370	727		616	523
v/s Ratio Prot			c0.20	0.29		0.06	0.45		c0.46	
v/s Ratio Perm		0.44	c1.13		0.31	0.56				0.07
v/c Ratio		1.33	2.28	0.57	0.62	1.22	0.99		1.38	0.20
Uniform Delay, d1		46.9	34.7	24.5	25.3	36.9	37.6		46.9	33.6
Progression Factor		0.67	1.03	1.02	1.03	1.02	1.02		1.00	1.00
Incremental Delay, d2		147.5	585.3	1.9	2.6	118.8	27.7		183.1	0.9
Delay (s)		178.8	620.8	26.9	28.7	156.6	65.9		229.9	34.4
Level of Service		F	F	C	C	F	E		F	C
Approach Delay (s)		178.8		241.2			100.9			
Approach LOS		F		F			F			

### Intersection Summary

HCM 2000 Control Delay	184.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.99		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	17.2
Intersection Capacity Utilization	178.1%	ICU Level of Service	H
Analysis Period (min)	15		

! Phase conflict between lane groups.

c Critical Lane Group

Queues

110: Morgan St & Brorein St & Selmon Expy Off-Ramp

01/19/2022



Lane Group	WBT	NBL	NBT	NBR2	SBL	SBT	SWR	SWR2
Lane Group Flow (vph)	1552	593	533	522	452	718	853	177
v/c Ratio	1.33	2.28	0.57	0.63	1.22	0.99	1.38	0.30
Control Delay	176.4	604.9	27.4	25.6	143.8	65.7	219.5	15.0
Queue Delay	0.5	0.0	8.4	5.9	0.0	37.8	0.0	0.0
Total Delay	176.9	604.9	35.7	31.5	143.8	103.5	219.5	15.0
Queue Length 50th (ft)	~982	~779	399	359	~349	652	~1030	43
Queue Length 95th (ft)	m#671	m#990	m492	m467	m#585	m#865	#1283	104
Internal Link Dist (ft)	494		424			563		
Turn Bay Length (ft)		250		10			300	300
Base Capacity (vph)	1170	260	931	827	372	728	616	596
Starvation Cap Reductn	129	0	355	245	0	111	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.49	2.28	0.93	0.90	1.22	1.16	1.38	0.30

Intersection Summary






















- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.



# HCM 6th Signalized Intersection Summary

111: Jefferson St & Brorein St

01/19/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	526	431	28	3	977	764	208	149	487	158	166	244
Future Volume (veh/h)	526	431	28	3	977	764	208	149	487	158	166	244
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	572	468	30	3	1062	830	226	162	529	172	180	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	325	948	61	368	704	492	376	473	422	172	525	
Arrive On Green	0.15	0.55	0.55	0.70	0.70	0.70	0.05	0.27	0.27	0.02	0.09	0.00
Sat Flow, veh/h	1781	1739	111	900	2000	1396	1781	1777	1585	1781	1870	1585
Grp Volume(v), veh/h	572	0	498	3	930	962	226	162	529	172	180	0
Grp Sat Flow(s),veh/h/ln	1781	0	1850	900	1777	1619	1781	1777	1585	1781	1870	1585
Q Serve(g_s), s	21.5	0.0	23.5	0.1	49.3	49.3	7.5	10.3	37.3	9.5	12.6	0.0
Cycle Q Clear(g_c), s	21.5	0.0	23.5	0.1	49.3	49.3	7.5	10.3	37.3	9.5	12.6	0.0
Prop In Lane	1.00		0.06	1.00		0.86	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	325	0	1008	368	626	570	376	473	422	172	525	
V/C Ratio(X)	1.76	0.00	0.49	0.01	1.49	1.69	0.60	0.34	1.25	1.00	0.34	
Avail Cap(c_a), veh/h	325	0	1008	368	626	570	376	473	422	172	525	
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	0.31	0.00	0.31	0.82	0.82	0.82	0.98	0.98	0.98	1.00	1.00	0.00
Uniform Delay (d), s/veh	46.9	0.0	19.8	13.4	20.7	20.7	42.2	41.4	51.4	41.8	51.4	0.0
Incr Delay (d2), s/veh	346.0	0.0	0.5	0.0	225.5	315.9	6.8	1.9	131.6	68.1	1.8	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	42.7	0.0	10.2	0.0	51.3	61.0	4.1	4.8	30.2	7.9	6.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	392.9	0.0	20.4	13.5	246.2	336.6	49.0	43.4	182.9	109.9	53.2	0.0
LnGrp LOS	F	A	C	B	F	F	D	D	F	F	D	
Approach Vol, veh/h		1070			1895			917			352	A
Approach Delay, s/veh		219.5			291.7			125.3			80.9	
Approach LOS		F			F			F			F	
Timer - Assigned Phs	1	2	3	4	6	7	8					
Phs Duration (G+Y+Rc), s	27.0	55.0	15.0	43.0	82.0	13.0	45.0					
Change Period (Y+Rc), s	5.5	* 5.7	5.5	* 5.7	* 5.7	5.5	* 5.7					
Max Green Setting (Gmax), s	21.5	* 49	9.5	* 37	* 76	7.5	* 39					
Max Q Clear Time (g_c+I1), s	23.5	51.3	11.5	39.3	25.5	9.5	14.6					
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	3.7	0.0	1.0					

## Intersection Summary

HCM 6th Ctrl Delay	219.9
HCM 6th LOS	F

## Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.  
 Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Queues

111: Jefferson St & Brorein St

01/19/2022



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	572	498	3	1892	226	691	172	180	265
v/c Ratio	1.76	0.49	0.01	1.50	0.59	0.64	0.83	0.34	0.42
Control Delay	375.5	6.8	22.7	251.2	40.3	23.2	51.0	40.4	6.7
Queue Delay	0.0	1.2	0.0	2.9	1.1	7.5	60.4	0.0	0.2
Total Delay	375.5	8.0	22.7	254.1	41.3	30.7	111.3	40.4	6.9
Queue Length 50th (ft)	~710	138	1	~1224	141	141	113	143	46
Queue Length 95th (ft)	m#769	m124	m2	m#1130	211	211	m#139	m172	m46
Internal Link Dist (ft)		494		148		443		116	
Turn Bay Length (ft)	150		50		100		50		
Base Capacity (vph)	325	1007	315	1264	386	1083	208	522	634
Starvation Cap Reductn	0	293	0	3	0	0	0	0	0
Spillback Cap Reductn	0	144	0	551	44	345	65	0	60
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.76	0.70	0.01	2.65	0.66	0.94	1.20	0.34	0.46

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

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

HCM 6th Signalized Intersection Summary  
 112: Nebraska Ave & Brorein St

01/19/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↕			↕			↕	
Traffic Volume (veh/h)	106	704	266	51	1113	68	202	23	355	9	13	429
Future Volume (veh/h)	106	704	266	51	1113	68	202	23	355	9	13	429
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	115	765	289	55	1210	74	220	25	386	10	14	466
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	338	862	326	408	2267	139	78	5	76	30	17	406
Arrive On Green	1.00	1.00	1.00	1.00	1.00	1.00	0.25	0.25	0.25	0.25	0.25	0.25
Sat Flow, veh/h	430	1294	489	535	3402	208	173	20	303	16	67	1610
Grp Volume(v), veh/h	115	0	1054	55	631	653	631	0	0	490	0	0
Grp Sat Flow(s),veh/h/ln	430	0	1782	535	1777	1833	495	0	0	1693	0	0
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	35.3	0.0	0.0	35.3	0.0	0.0
Prop In Lane	1.00		0.27	1.00		0.11	0.35		0.61	0.02		0.95
Lane Grp Cap(c), veh/h	338	0	1188	408	1184	1222	159	0	0	453	0	0
V/C Ratio(X)	0.34	0.00	0.89	0.13	0.53	0.53	3.96	0.00	0.00	1.08	0.00	0.00
Avail Cap(c_a), veh/h	338	0	1188	408	1184	1222	159	0	0	453	0	0
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.79	0.00	0.79	0.09	0.09	0.09	0.75	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	56.2	0.0	0.0	53.9	0.0	0.0
Incr Delay (d2), s/veh	2.2	0.0	8.1	0.1	0.2	0.2	1341.6	0.0	0.0	65.9	0.0	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	2.7	0.0	0.1	0.1	65.2	0.0	0.0	24.6	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	2.2	0.0	8.1	0.1	0.2	0.2	1397.8	0.0	0.0	119.8	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	F	A	A	F	A	A
Approach Vol, veh/h		1169			1339			631				490
Approach Delay, s/veh		7.5			0.2			1397.8				119.8
Approach LOS		A			A			F				F
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		99.0		41.0		99.0		41.0				
Change Period (Y+Rc), s		* 5.7		* 5.7		* 5.7		* 5.7				
Max Green Setting (Gmax), s		* 93		* 35		* 93		* 35				
Max Q Clear Time (g_c+I1), s		2.0		37.3		2.0		37.3				
Green Ext Time (p_c), s		14.6		0.0		18.8		0.0				

Intersection Summary

HCM 6th Ctrl Delay	261.7
HCM 6th LOS	F

Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Queues

112: Nebraska Ave & Brorein St

01/19/2022



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	115	1054	55	1284	631	490
v/c Ratio	0.57	0.88	0.44	0.55	3.80	1.03
Control Delay	31.6	35.8	18.9	15.9	1287.8	90.8
Queue Delay	2.9	16.2	0.0	2.2	22.9	37.3
Total Delay	34.5	51.9	18.9	18.0	1310.7	128.1
Queue Length 50th (ft)	76	849	32	398	~900	~406
Queue Length 95th (ft)	m149	1028	m39	m351	#1140	#633
Internal Link Dist (ft)		148		203	457	414
Turn Bay Length (ft)	50		70			
Base Capacity (vph)	203	1199	125	2340	166	474
Starvation Cap Reductn	33	118	0	871	0	0
Spillback Cap Reductn	0	161	0	652	103	314
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.68	1.02	0.44	0.87	10.02	3.06

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

# HCM 6th Signalized Intersection Summary

701: Water St

01/19/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↕		↖	↗		↖	↗	
Traffic Volume (veh/h)	83	891	94	32	572	13	462	137	49	7	42	198
Future Volume (veh/h)	83	891	94	32	572	13	462	137	49	7	42	198
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	90	968	102	35	622	14	502	149	53	8	46	215
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	598	1151	121	416	2459	55	155	362	129	147	54	252
Arrive On Green	1.00	1.00	1.00	1.00	1.00	1.00	0.02	0.09	0.09	0.19	0.19	0.19
Sat Flow, veh/h	792	1664	175	527	3553	80	1781	1317	469	1180	287	1342
Grp Volume(v), veh/h	90	0	1070	35	311	325	502	0	202	8	0	261
Grp Sat Flow(s),veh/h/ln	792	0	1839	527	1777	1856	1781	0	1786	1180	0	1629
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	6.5	0.0	15.0	0.9	0.0	21.7
Cycle Q Clear(g_c), s	0.2	0.0	0.0	0.2	0.0	0.0	6.5	0.0	15.0	15.8	0.0	21.7
Prop In Lane	1.00		0.10	1.00		0.04	1.00		0.26	1.00		0.82
Lane Grp Cap(c), veh/h	598	0	1273	416	1230	1285	155	0	491	147	0	306
V/C Ratio(X)	0.15	0.00	0.84	0.08	0.25	0.25	3.24	0.00	0.41	0.05	0.00	0.85
Avail Cap(c_a), veh/h	598	0	1273	416	1230	1285	155	0	491	147	0	306
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	0.36	0.00	0.36	0.86	0.86	0.86	0.94	0.00	0.94	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	67.2	0.0	52.9	59.5	0.0	55.0
Incr Delay (d2), s/veh	0.2	0.0	2.6	0.3	0.4	0.4	1023.5	0.0	2.4	0.7	0.0	24.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.9	0.0	0.1	0.1	49.8	0.0	7.6	0.3	0.0	11.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.2	0.0	2.6	0.3	0.4	0.4	1090.8	0.0	55.3	60.2	0.0	79.8
LnGrp LOS	A	A	A	A	A	A	F	A	E	E	A	E
Approach Vol, veh/h		1160			671			704				269
Approach Delay, s/veh		2.4			0.4			793.7				79.2
Approach LOS		A			A			F				E
Timer - Assigned Phs		2		4		6	7	8				
Phs Duration (G+Y+Rc), s		102.8		44.2		102.8	12.2	32.0				
Change Period (Y+Rc), s		* 5.7		* 5.7		* 5.7	* 5.7	* 5.7				
Max Green Setting (Gmax), s		* 90		* 38		* 90	* 6.5	* 26				
Max Q Clear Time (g_c+I1), s		2.2		17.0		2.2	8.5	23.7				
Green Ext Time (p_c), s		5.1		1.2		15.8	0.0	0.4				

## Intersection Summary

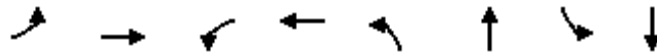
HCM 6th Ctrl Delay	208.0
HCM 6th LOS	F

## Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Queues  
701: Water St

01/19/2022



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	90	1070	35	636	502	202	8	261
v/c Ratio	0.19	0.90	0.41	0.28	2.20	0.40	0.05	0.61
Control Delay	8.6	20.3	20.1	6.4	581.3	42.9	47.9	28.9
Queue Delay	0.0	47.2	0.0	0.0	12.2	0.0	0.0	1.2
Total Delay	8.6	67.5	20.1	6.5	593.6	42.9	47.9	30.1
Queue Length 50th (ft)	27	832	7	63	~728	151	6	93
Queue Length 95th (ft)	m24	m460	m13	67	#912	231	22	191
Internal Link Dist (ft)		203		452		462		361
Turn Bay Length (ft)	70		70		150		150	
Base Capacity (vph)	462	1187	86	2277	228	499	160	426
Starvation Cap Reductn	0	321	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	176	113	0	0	50
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	1.24	0.41	0.30	4.37	0.40	0.05	0.69

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

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

HCM 6th Signalized Intersection Summary  
 120: Meridian Ave & Cumberland Ave

01/19/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔			↔	↔	↔	↕		↔	↕	↔
Traffic Volume (veh/h)	737	120	90	1	466	120	97	974	121	230	434	64
Future Volume (veh/h)	737	120	90	1	466	120	97	974	121	230	434	64
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	801	130	98	1	507	0	105	1059	132	250	472	70
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	343	465	351	26	879		383	1127	140	134	1259	562
Arrive On Green	0.78	0.78	0.78	0.47	0.47	0.00	0.01	0.12	0.12	0.08	0.71	0.71
Sat Flow, veh/h	892	990	746	0	1870	1585	1781	3180	396	1781	3554	1585
Grp Volume(v), veh/h	801	0	228	508	0	0	105	591	600	250	472	70
Grp Sat Flow(s),veh/h/ln	892	0	1736	1870	0	1585	1781	1777	1799	1781	1777	1585
Q Serve(g_s), s	38.1	0.0	5.1	0.0	0.0	0.0	5.2	46.2	46.3	5.6	7.4	2.0
Cycle Q Clear(g_c), s	65.8	0.0	5.1	27.7	0.0	0.0	5.2	46.2	46.3	5.6	7.4	2.0
Prop In Lane	1.00		0.43	0.00		1.00	1.00		0.22	1.00		1.00
Lane Grp Cap(c), veh/h	343	0	816	905	0		383	630	637	134	1259	562
V/C Ratio(X)	2.34	0.00	0.28	0.56	0.00		0.27	0.94	0.94	1.87	0.37	0.12
Avail Cap(c_a), veh/h	343	0	816	905	0		383	630	637	134	1259	562
HCM Platoon Ratio	1.67	1.67	1.67	1.00	1.00	1.00	0.33	0.33	0.33	2.00	2.00	2.00
Upstream Filter(I)	0.32	0.00	0.32	1.00	0.00	0.00	0.09	0.09	0.09	0.97	0.97	0.97
Uniform Delay (d), s/veh	27.1	0.0	8.5	27.0	0.0	0.0	28.3	60.3	60.4	41.2	14.2	13.5
Incr Delay (d2), s/veh	604.2	0.0	0.3	2.5	0.0	0.0	0.2	3.5	3.6	417.6	0.8	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	69.2	0.0	1.8	13.1	0.0	0.0	2.3	22.7	23.0	17.5	2.6	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	631.3	0.0	8.8	29.5	0.0	0.0	28.4	63.8	63.9	458.8	15.1	13.9
LnGrp LOS	F	A	A	C	A		C	E	E	F	B	B
Approach Vol, veh/h		1029			508	A		1296			792	
Approach Delay, s/veh		493.3			29.5			61.0			155.0	
Approach LOS		F			C			E			F	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	12.0	56.0		72.0	12.0	56.0		72.0				
Change Period (Y+Rc), s	6.4	6.4		* 6.2	6.4	6.4		* 6.2				
Max Green Setting (Gmax), s	5.6	49.6		* 66	5.6	49.6		* 66				
Max Q Clear Time (g_c+I1), s	7.2	9.4		67.8	7.6	48.3		29.7				
Green Ext Time (p_c), s	0.0	3.4		0.0	0.0	0.9		3.9				

Intersection Summary

HCM 6th Ctrl Delay	199.9
HCM 6th LOS	F

Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.  
 Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Queues

120: Meridian Ave & Cumberland Ave

01/19/2022



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	801	228	508	130	105	1191	250	472	70
v/c Ratio	2.96	0.27	0.58	0.17	0.31	0.96	2.02	0.38	0.11
Control Delay	900.6	11.5	30.4	9.8	21.3	47.8	508.4	24.0	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	42.7	0.0	0.0	0.0
Total Delay	900.6	11.5	30.4	9.8	21.3	90.5	508.4	24.0	2.0
Queue Length 50th (ft)	~1012	27	331	27	46	324	~296	128	2
Queue Length 95th (ft)	m#1189	m57	447	65	m53	m326	#494	170	4
Internal Link Dist (ft)		452	888			460		712	
Turn Bay Length (ft)	100			100	200		250		
Base Capacity (vph)	271	839	875	784	336	1239	124	1253	609
Starvation Cap Reductn	0	0	0	0	0	219	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	2.96	0.27	0.58	0.17	0.31	1.17	2.02	0.38	0.11

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.






















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



# HCM Signalized Intersection Capacity Analysis

## 102: Florida Ave & Whiting St

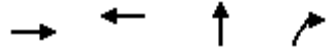
01/19/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 			   				
Traffic Volume (vph)	194	502	0	0	373	287	133	2399	108	0	0	0
Future Volume (vph)	194	502	0	0	373	287	133	2399	108	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			5.7	5.7			
Lane Util. Factor		0.95			0.95			0.91	1.00			
Frt		1.00			0.93			1.00	0.85			
Flt Protected		0.99			1.00			1.00	1.00			
Satd. Flow (prot)		3491			3308			5072	1583			
Flt Permitted		0.55			1.00			1.00	1.00			
Satd. Flow (perm)		1943			3308			5072	1583			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	211	546	0	0	405	312	145	2608	117	0	0	0
RTOR Reduction (vph)	0	0	0	0	28	0	0	0	18	0	0	0
Lane Group Flow (vph)	0	757	0	0	689	0	0	2753	99	0	0	0
Turn Type	Perm	NA			NA		Perm	NA	Perm			
Protected Phases		4			4			2				
Permitted Phases	4						2		2			
Actuated Green, G (s)		49.0			49.0			74.3	74.3			
Effective Green, g (s)		49.0			49.0			74.3	74.3			
Actuated g/C Ratio		0.35			0.35			0.53	0.53			
Clearance Time (s)		6.0			6.0			5.7	5.7			
Vehicle Extension (s)		3.0			3.0			3.0	3.0			
Lane Grp Cap (vph)		680			1157			2691	840			
v/s Ratio Prot					0.21							
v/s Ratio Perm		c0.39						0.54	0.06			
v/c Ratio		1.36dl			0.60			1.02	0.12			
Uniform Delay, d1		45.5			37.4			32.9	16.4			
Progression Factor		1.00			0.75			1.00	1.00			
Incremental Delay, d2		69.9			1.3			23.5	0.3			
Delay (s)		115.4			29.5			56.3	16.7			
Level of Service		F			C			E	B			
Approach Delay (s)		115.4			29.5			54.7			0.0	
Approach LOS		F			C			D			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			61.1				HCM 2000 Level of Service		E			
HCM 2000 Volume to Capacity ratio			1.03									
Actuated Cycle Length (s)			140.0				Sum of lost time (s)		13.7			
Intersection Capacity Utilization			102.8%				ICU Level of Service		G			
Analysis Period (min)			15									
dl Defacto Left Lane. Recode with 1 though lane as a left lane.												
c Critical Lane Group												

# Queues

## 102: Florida Ave & Whiting St

01/19/2022
























Lane Group	EBT	WBT	NBT	NBR
Lane Group Flow (vph)	757	717	2753	117
v/c Ratio	1.36dl	0.60	1.02	0.14
Control Delay	112.0	28.0	56.2	11.4
Queue Delay	0.0	0.0	31.3	0.0
Total Delay	112.0	28.0	87.4	11.4
Queue Length 50th (ft)	~414	168	~974	34
Queue Length 95th (ft)	#545	m276	#1056	67
Internal Link Dist (ft)	821	519	567	
Turn Bay Length (ft)				100
Base Capacity (vph)	680	1186	2690	858
Starvation Cap Reductn	0	0	431	0
Spillback Cap Reductn	1	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.11	0.60	1.22	0.14

### Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.
- dl Defacto Left Lane. Recode with 1 though lane as a left lane.

HCM Signalized Intersection Capacity Analysis  
103: Morgan St & Whiting St

01/19/2022

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	139	458	156	144	432	173	162	533	93	57	499	65	
Future Volume (vph)	139	458	156	144	432	173	162	533	93	57	499	65	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	5.8	5.8		5.8	5.8			5.7			5.7		
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95		
Frt	1.00	0.96		1.00	0.96			0.98			0.98		
Flt Protected	0.95	1.00		0.95	1.00			0.99			1.00		
Satd. Flow (prot)	1770	1792		1770	1783			3441			3467		
Flt Permitted	0.17	1.00		0.16	1.00			0.62			0.70		
Satd. Flow (perm)	317	1792		301	1783			2148			2432		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	151	498	170	157	470	188	176	579	101	62	542	71	
RTOR Reduction (vph)	0	9	0	0	10	0	0	8	0	0	6	0	
Lane Group Flow (vph)	151	659	0	157	648	0	0	848	0	0	669	0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA		
Protected Phases		4			4			2			2		
Permitted Phases	4			4			2			2			
Actuated Green, G (s)	64.2	64.2		64.2	64.2			64.3			64.3		
Effective Green, g (s)	64.2	64.2		64.2	64.2			64.3			64.3		
Actuated g/C Ratio	0.46	0.46		0.46	0.46			0.46			0.46		
Clearance Time (s)	5.8	5.8		5.8	5.8			5.7			5.7		
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0		
Lane Grp Cap (vph)	145	821		138	817			986			1116		
v/s Ratio Prot		0.37			0.36								
v/s Ratio Perm	0.48			c0.52				c0.39			0.27		
v/c Ratio	1.04	0.80		1.14	0.79			0.86			0.60		
Uniform Delay, d1	37.9	32.5		37.9	32.2			33.8			28.2		
Progression Factor	0.47	0.48		0.94	0.94			0.85			1.00		
Incremental Delay, d2	70.4	5.3		112.3	6.7			9.1			2.4		
Delay (s)	88.3	20.8		147.9	36.9			37.9			30.6		
Level of Service	F	C		F	D			D			C		
Approach Delay (s)		33.3			58.3			37.9			30.6		
Approach LOS		C			E			D			C		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			40.4									HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio			1.00										
Actuated Cycle Length (s)			140.0									Sum of lost time (s)	11.5
Intersection Capacity Utilization			101.0%									ICU Level of Service	G
Analysis Period (min)			15										

c Critical Lane Group

Queues

103: Morgan St & Whiting St

01/19/2022



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	151	668	157	658	856	675
v/c Ratio	1.04	0.80	1.14	0.80	0.86	0.60
Control Delay	93.7	20.9	146.9	36.8	38.1	30.5
Queue Delay	0.0	3.0	0.0	13.4	0.2	1.6
Total Delay	93.7	23.9	146.9	50.2	38.3	32.1
Queue Length 50th (ft)	~144	195	~166	427	220	233
Queue Length 95th (ft)	m#174	m200	m#287	652	317	300
Internal Link Dist (ft)		519		503	563	436
Turn Bay Length (ft)			150			
Base Capacity (vph)	145	830	138	827	994	1123
Starvation Cap Reductn	0	85	0	159	0	0
Spillback Cap Reductn	0	1	0	0	7	268
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.04	0.90	1.14	0.99	0.87	0.79

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis  
 104: Jefferson St & Whiting St

01/19/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↕↕			↕↕			↕↕			↕↕		
Traffic Volume (vph)	83	392	389	55	326	279	159	445	17	119	493	71	
Future Volume (vph)	83	392	389	55	326	279	159	445	17	119	493	71	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		6.1			6.1			6.1			6.0		
Lane Util. Factor		0.95			0.95			0.95			0.95		
Frt		0.93			0.94			1.00			0.98		
Flt Protected		1.00			1.00			0.99			0.99		
Satd. Flow (prot)		3284			3301			3480			3454		
Flt Permitted		0.67			0.66			0.57			0.63		
Satd. Flow (perm)		2225			2178			2008			2187		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	90	426	423	60	354	303	173	484	18	129	536	77	
RTOR Reduction (vph)	0	110	0	0	87	0	0	1	0	0	6	0	
Lane Group Flow (vph)	0	829		0	0	630	0	0	674	0	0	736	
Turn Type	pm+pt	NA		Perm		NA		pm+pt		NA		Perm	NA
Protected Phases	3	8				4		1		6		2	
Permitted Phases	8			4				6				2	
Actuated Green, G (s)		59.5			59.5			59.9			60.0		
Effective Green, g (s)		59.5			59.5			59.9			60.0		
Actuated g/C Ratio		0.42			0.42			0.43			0.43		
Clearance Time (s)		6.1			6.1			6.1			6.0		
Vehicle Extension (s)		3.0			3.0			3.0			3.0		
Lane Grp Cap (vph)		945			925			859			937		
v/s Ratio Prot													
v/s Ratio Perm		c0.37			0.29			0.34			c0.34		
v/c Ratio		0.88			0.68			0.78			0.79		
Uniform Delay, d1		36.9			32.6			34.5			34.5		
Progression Factor		1.24			0.84			0.49			1.00		
Incremental Delay, d2		7.9			2.0			0.4			6.6		
Delay (s)		53.7			29.3			17.2			41.1		
Level of Service		D			C			B			D		
Approach Delay (s)		53.7			29.3			17.2			41.1		
Approach LOS		D			C			B			D		

Intersection Summary

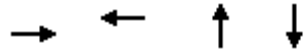
HCM 2000 Control Delay	36.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	25.9
Intersection Capacity Utilization	102.4%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Queues

104: Jefferson St & Whiting St

01/19/2022



Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	939	717	675	742
v/c Ratio	0.89	0.71	0.78	0.79
Control Delay	45.8	25.2	17.7	41.3
Queue Delay	0.0	0.1	0.7	0.7
Total Delay	45.8	25.3	18.4	41.9
Queue Length 50th (ft)	382	143	227	299
Queue Length 95th (ft)	471	115	m115	387
Internal Link Dist (ft)	503	427	450	207
Turn Bay Length (ft)				
Base Capacity (vph)	1104	1017	860	943
Starvation Cap Reductn	0	23	0	0
Spillback Cap Reductn	0	17	39	43
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.85	0.72	0.82	0.82

Intersection Summary

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

# HCM Signalized Intersection Capacity Analysis

## 715: Selmon Expy Off-Ramp & Whiting St

01/19/2022



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	↗↗
Traffic Volume (vph)	531	0	0	527	163	619
Future Volume (vph)	531	0	0	527	163	619
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.7			5.7	6.0	6.0
Lane Util. Factor	0.95			0.95	1.00	0.88
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3539			3539	1770	2787
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3539			3539	1770	2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	577	0	0	573	177	673
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	577	0	0	573	177	673
Turn Type	NA			NA	Prot	custom
Protected Phases	5			2	4	4 6
Permitted Phases						
Actuated Green, G (s)	30.3			84.3	44.0	98.0
Effective Green, g (s)	30.3			84.3	44.0	92.3
Actuated g/C Ratio	0.22			0.60	0.31	0.66
Clearance Time (s)	5.7			5.7	6.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	765			2130	556	1837
v/s Ratio Prot	c0.16			0.16	0.10	c0.24
v/s Ratio Perm						
v/c Ratio	0.75			0.27	0.32	0.37
Uniform Delay, d1	51.4			13.2	36.6	10.7
Progression Factor	0.79			1.01	1.00	1.00
Incremental Delay, d2	2.3			0.2	1.5	0.6
Delay (s)	42.8			13.6	38.1	11.3
Level of Service	D			B	D	B
Approach Delay (s)	42.8			13.6	16.9	
Approach LOS	D			B	B	

### Intersection Summary

HCM 2000 Control Delay	23.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	17.4
Intersection Capacity Utilization	46.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

## Queues

### 715: Selmon Expy Off-Ramp & Whiting St

01/21/2022



Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	577	573	177	673
v/c Ratio	0.75	0.27	0.32	0.34
Control Delay	43.8	13.7	38.6	9.5
Queue Delay	0.0	0.9	0.0	0.0
Total Delay	43.8	14.6	38.6	9.5
Queue Length 50th (ft)	227	176	123	125
Queue Length 95th (ft)	m260	m194	190	193
Internal Link Dist (ft)	427	276	783	
Turn Bay Length (ft)			350	350
Base Capacity (vph)	1625	2130	556	1951
Starvation Cap Reductn	0	1219	0	0
Spillback Cap Reductn	111	0	0	3
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.38	0.63	0.32	0.35

#### Intersection Summary

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



HCM 6th Signalized Intersection Summary  
 11: Water St/Brush St & Whiting St

01/19/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑↑	↗	↖	↑↑		↖	↗			↕	
Traffic Volume (veh/h)	223	778	150	248	240	63	208	221	62	164	88	79
Future Volume (veh/h)	223	778	150	248	240	63	208	221	62	164	88	79
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	242	846	163	270	261	68	226	240	67	178	96	86
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	717	1925	919	426	1532	392	294	355	99	103	35	31
Arrive On Green	0.08	0.54	0.54	0.09	0.55	0.55	0.04	0.25	0.25	0.17	0.17	0.17
Sat Flow, veh/h	1781	3554	1585	1781	2802	716	1781	1407	393	371	200	179
Grp Volume(v), veh/h	242	846	163	270	164	165	226	0	307	360	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1741	1781	0	1800	751	0	0
Q Serve(g_s), s	8.4	20.0	6.7	9.3	6.4	6.7	5.3	0.0	21.5	13.8	0.0	0.0
Cycle Q Clear(g_c), s	8.4	20.0	6.7	9.3	6.4	6.7	5.3	0.0	21.5	24.3	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.41	1.00		0.22	0.49		0.24
Lane Grp Cap(c), veh/h	717	1925	919	426	972	952	294	0	454	169	0	0
V/C Ratio(X)	0.34	0.44	0.18	0.63	0.17	0.17	0.77	0.00	0.68	2.13	0.00	0.00
Avail Cap(c_a), veh/h	1013	1925	919	573	972	952	294	0	454	169	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.83	0.83	0.83	0.94	0.94	0.94	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	11.8	19.3	13.8	14.2	15.8	15.9	51.3	0.0	47.2	64.7	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.6	0.4	1.5	0.4	0.4	11.7	0.0	4.0	529.2	0.0	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	8.5	2.6	3.9	2.7	2.8	6.1	0.0	10.3	30.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.1	19.9	14.1	15.7	16.2	16.3	63.0	0.0	51.2	593.9	0.0	0.0
LnGrp LOS	B	B	B	B	B	B	E	A	D	F	A	A
Approach Vol, veh/h		1251			599			533				360
Approach Delay, s/veh		17.6			16.0			56.2				593.9
Approach LOS		B			B			E				F
Timer - Assigned Phs	1	2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s	16.7	82.3		41.0	17.5	81.5	11.0	30.0				
Change Period (Y+Rc), s	* 5.7	* 5.7		* 5.7	5.5	* 5.7	* 5.7	* 5.7				
Max Green Setting (Gmax), s	* 34	* 53		* 35	23.5	* 64	* 5.3	* 24				
Max Q Clear Time (g_c+I1), s	10.4	8.7		23.5	11.3	22.0	7.3	26.3				
Green Ext Time (p_c), s	0.7	2.1		1.5	0.6	8.0	0.0	0.0				

Intersection Summary

HCM 6th Ctrl Delay	100.4
HCM 6th LOS	F

Notes

User approved pedestrian interval to be less than phase max green.  
 \* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Queues

11: Water St/Brush St & Whiting St

01/21/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	242	846	163	270	329	226	307	360
v/c Ratio	0.34	0.45	0.16	0.62	0.18	0.86	0.67	1.98
Control Delay	6.8	17.3	2.7	22.6	23.6	77.0	53.5	488.2
Queue Delay	0.1	1.6	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.9	18.9	2.7	22.6	23.6	77.0	53.5	488.2
Queue Length 50th (ft)	40	273	26	134	93	178	245	~505
Queue Length 95th (ft)	55	316	50	191	133	#322	352	#708
Internal Link Dist (ft)		276			426		126	215
Turn Bay Length (ft)	100		200	300		50		
Base Capacity (vph)	865	1866	1023	537	1841	264	461	182
Starvation Cap Reductn	152	797	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.79	0.16	0.50	0.18	0.86	0.67	1.98

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

# HCM Signalized Intersection Capacity Analysis

## 7: Meridian Ave & Whiting St

01/19/2022



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	551	453	124	1719	400	427
Future Volume (vph)	551	453	124	1719	400	427
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	6.9	6.4	6.6	4.0
Lane Util. Factor	0.97	1.00	1.00	0.91	0.86	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3433	1583	1770	5085	6408	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3433	1583	1770	5085	6408	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	599	492	135	1868	435	464
RTOR Reduction (vph)	0	340	0	0	0	0
Lane Group Flow (vph)	599	152	135	1868	435	464
Turn Type	Prot	Perm	Prot	NA	NA	Free
Protected Phases	7 8		1	6	2	
Permitted Phases		7 8				Free
Actuated Green, G (s)	43.3	43.3	18.1	82.6	57.4	140.0
Effective Green, g (s)	43.3	43.3	18.1	82.6	57.4	140.0
Actuated g/C Ratio	0.31	0.31	0.13	0.59	0.41	1.00
Clearance Time (s)			6.9	6.4	6.6	
Vehicle Extension (s)			3.0	3.0	3.0	
Lane Grp Cap (vph)	1061	489	228	3000	2627	1583
v/s Ratio Prot	c0.17		0.08	c0.37	0.07	
v/s Ratio Perm		0.10				0.29
v/c Ratio	0.56	0.31	0.59	0.62	0.17	0.29
Uniform Delay, d1	40.5	37.0	57.5	18.6	26.1	0.0
Progression Factor	0.53	0.95	1.20	0.21	1.00	1.00
Incremental Delay, d2	0.5	0.3	3.1	0.7	0.1	0.5
Delay (s)	22.0	35.5	72.2	4.6	26.3	0.5
Level of Service	C	D	E	A	C	A
Approach Delay (s)	28.1			9.2	13.0	
Approach LOS	C			A	B	

### Intersection Summary

HCM 2000 Control Delay	15.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.7
Intersection Capacity Utilization	58.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

# Queues

## 7: Meridian Ave & Whiting St

01/21/2022



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	599	492	135	1868	435	464
v/c Ratio	0.54	0.58	0.59	0.62	0.17	0.29
Control Delay	21.5	4.4	75.9	4.9	28.5	0.5
Queue Delay	0.0	0.4	0.2	0.1	0.0	0.0
Total Delay	21.5	4.8	76.1	5.0	28.5	0.5
Queue Length 50th (ft)	188	4	103	72	71	0
Queue Length 95th (ft)	m110	m21	m138	79	113	0
Internal Link Dist (ft)	426			229	186	
Turn Bay Length (ft)	200	250	150			
Base Capacity (vph)	1581	994	355	3001	2627	1583
Starvation Cap Reductn	0	158	22	265	0	0
Spillback Cap Reductn	0	3	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.59	0.41	0.68	0.17	0.29

### Intersection Summary

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

# HCM Signalized Intersection Capacity Analysis

## 107: Meridian Ave & Whiting St

01/19/2022



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		↑↑↑		↑	↑↑↑
Traffic Volume (vph)	62	119	1725	106	187	666
Future Volume (vph)	62	119	1725	106	187	666
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.7		6.4		5.5	6.9
Lane Util. Factor	1.00		0.91		1.00	0.91
Frt	0.91		0.99		1.00	1.00
Flt Protected	0.98		1.00		0.95	1.00
Satd. Flow (prot)	1669		5041		1770	5085
Flt Permitted	0.98		1.00		0.05	1.00
Satd. Flow (perm)	1669		5041		101	5085
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	67	129	1875	115	203	724
RTOR Reduction (vph)	59	0	4	0	0	0
Lane Group Flow (vph)	137	0	1986	0	203	724
Turn Type	Prot		NA		custom	NA
Protected Phases	8		6		7	1 2 7
Permitted Phases					1 2	
Actuated Green, G (s)	19.3		82.6		100.9	107.5
Effective Green, g (s)	19.3		82.6		94.0	100.9
Actuated g/C Ratio	0.14		0.59		0.67	0.72
Clearance Time (s)	7.7		6.4		5.5	
Vehicle Extension (s)	3.0		3.0		3.0	
Lane Grp Cap (vph)	230		2974		288	3664
v/s Ratio Prot	c0.08		c0.39		c0.09	0.14
v/s Ratio Perm					c0.38	
v/c Ratio	0.60		0.67		0.70	0.20
Uniform Delay, d1	56.7		19.4		37.5	6.4
Progression Factor	1.08		0.79		0.92	1.10
Incremental Delay, d2	4.1		0.1		7.3	0.0
Delay (s)	65.2		15.4		41.7	7.0
Level of Service	E		B		D	A
Approach Delay (s)	65.2		15.4			14.6
Approach LOS	E		B			B

### Intersection Summary

HCM 2000 Control Delay	18.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.7
Intersection Capacity Utilization	73.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

# Queues

## 107: Meridian Ave & Whiting St

01/19/2022



Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	196	1990	203	724
v/c Ratio	0.68	0.67	0.69	0.19
Control Delay	50.8	16.2	50.9	6.0
Queue Delay	0.0	0.2	0.1	0.2
Total Delay	50.8	16.4	51.1	6.2
Queue Length 50th (ft)	116	363	105	54
Queue Length 95th (ft)	195	m289	#214	84
Internal Link Dist (ft)	878	712		229
Turn Bay Length (ft)				
Base Capacity (vph)	505	2978	294	3824
Starvation Cap Reductn	0	270	2	2078
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.39	0.73	0.70	0.41

### Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

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

# HCS7 Two-Way Stop-Control Report

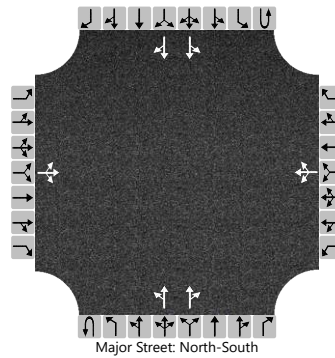
## General Information

Analyst	H.W. Lochner
Agency/Co.	
Date Performed	09/24/2021
Analysis Year	2036
Time Analyzed	PM Peak Hour
Intersection Orientation	North-South
Project Description	Whiting PD&E Study

## Site Information

Intersection	EWashingtonSt&JeffersonSt
Jurisdiction	FDOT, District 7
East/West Street	E Washington St
North/South Street	Jefferson St
Peak Hour Factor	0.95
Analysis Time Period (hrs)	1.00

## Lanes



## Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound				
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Movement																	
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6	
Number of Lanes		0	1	0		0	1	0		0	2	0		0	2	0	
Configuration			LTR				LTR			LT		TR		LT		TR	
Volume (veh/h)		22	110	86		137	50	126		134	595	78		183	461	38	
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2			
Proportion Time Blocked																	
Percent Grade (%)		0				0											
Right Turn Channelized																	
Median Type   Storage		Undivided															

## Critical and Follow-up Headways

Base Critical Headway (sec)		7.5	6.5	6.9		7.5	6.5	6.9		4.1				4.1		
Critical Headway (sec)		7.54	6.54	6.94		7.54	6.54	6.94		4.14				4.14		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.52	4.02	3.32		3.52	4.02	3.32		2.22				2.22		

## Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			229				329			141				193				
Capacity, c (veh/h)										1038				886				
v/c Ratio										0.14				0.22				
95% Queue Length, Q <sub>95</sub> (veh)										0.5				0.8				
Control Delay (s/veh)										9.0				10.2				
Level of Service (LOS)										A				B				
Approach Delay (s/veh)										2.0					3.3			
Approach LOS																		

# HCS7 Two-Way Stop-Control Report

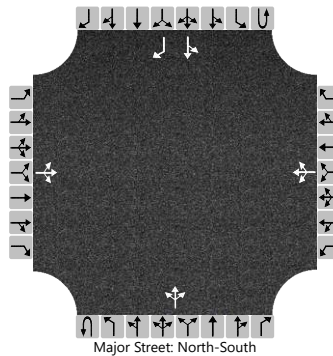
## General Information

Analyst	H.W. Lochner
Agency/Co.	
Date Performed	09/24/2021
Analysis Year	2036
Time Analyzed	PM Peak Hour
Intersection Orientation	North-South
Project Description	Whiting PD&E Study

## Site Information

Intersection	EWashingtonSt&BrushSt
Jurisdiction	FDOT, District 7
East/West Street	E Washington St
North/South Street	Brush St
Peak Hour Factor	0.95
Analysis Time Period (hrs)	1.00

## Lanes



## Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound				
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Movement																	
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6	
Number of Lanes		0	1	0		0	1	0		0	1	0		0	1	1	
Configuration			LTR				LTR				LTR			LT		R	
Volume (veh/h)		137	5	207		15	21	5		117	377	5		5	76	106	
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2			
Proportion Time Blocked																	
Percent Grade (%)		0				0											
Right Turn Channelized																Yes	
Median Type   Storage		Undivided															

## Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.12	6.52	6.22		7.12	6.52	6.22		4.12				4.12		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.52	4.02	3.32		3.52	4.02	3.32		2.22				2.22		

## Delay, Queue Length, and Level of Service

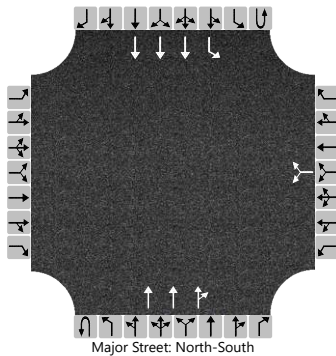
Flow Rate, v (veh/h)			367				43				123				5		
Capacity, c (veh/h)			489				259				1518				1157		
v/c Ratio			0.75				0.17				0.08				0.00		
95% Queue Length, Q <sub>95</sub> (veh)			8.0				0.6				0.3				0.0		
Control Delay (s/veh)			33.6				21.7				7.6				8.1		
Level of Service (LOS)			D				C				A				A		
Approach Delay (s/veh)		33.6				21.7				2.4				0.2			
Approach LOS		D				C											



# HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	H.W. Lochner	Intersection	MeridianAve&EWashingtonSt
Agency/Co.		Jurisdiction	FDOT, District 7
Date Performed	09/24/2021	East/West Street	Meridian Ave
Analysis Year	2036	North/South Street	E Washington St
Time Analyzed	PM Peak Hour	Peak Hour Factor	0.95
Intersection Orientation	North-South	Analysis Time Period (hrs)	1.00
Project Description	Whiting PD&E Study		

## Lanes



## Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0		0	3	0		0	1	3
Configuration							LR				T	TR		L	T	
Volume (veh/h)						41		121			1909	361		0	5	786
Percent Heavy Vehicles (%)						2		2						0	2	
Proportion Time Blocked																
Percent Grade (%)							0									
Right Turn Channelized																
Median Type   Storage							Left Only									1

## Critical and Follow-up Headways

Base Critical Headway (sec)						6.4		7.1							5.3	
Critical Headway (sec)						5.74		7.14							5.34	
Base Follow-Up Headway (sec)						3.8		3.9							3.1	
Follow-Up Headway (sec)						3.82		3.92							3.12	

















## Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							171								5	
Capacity, c (veh/h)							87								79	
v/c Ratio							1.95								0.07	
95% Queue Length, Q <sub>95</sub> (veh)							47.0								0.2	
Control Delay (s/veh)							1839.9								53.8	
Level of Service (LOS)							F								F	
Approach Delay (s/veh)							1839.9								0.3	
Approach LOS							F									

# HCM Signalized Intersection Capacity Analysis

## 114: Florida Ave & Channelside Dr

01/19/2022

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	1007	1536	525	0	0	0	0	300	124	0	0	0	
Future Volume (vph)	1007	1536	525	0	0	0	0	300	124	0	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	6.0	6.1						6.0	6.0				
Lane Util. Factor	*0.51	*0.76						*0.80	1.00				
Frt	1.00	0.96						1.00	0.85				
Flt Protected	0.95	1.00						1.00	1.00				
Satd. Flow (prot)	1805	2723						2980	1583				
Flt Permitted	0.95	1.00						1.00	1.00				
Satd. Flow (perm)	1805	2723						2980	1583				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	1095	1670	571	0	0	0	0	326	135	0	0	0	
RTOR Reduction (vph)	210	16	0	0	0	0	0	0	67	0	0	0	
Lane Group Flow (vph)	885	2225	0	0	0	0	0	326	68	0	0	0	
Turn Type	Prot	NA						NA	Perm				
Protected Phases	1	6						4					
Permitted Phases									4				
Actuated Green, G (s)	58.0	112.9						15.0	15.0				
Effective Green, g (s)	58.0	112.9						15.0	15.0				
Actuated g/C Ratio	0.41	0.81						0.11	0.11				
Clearance Time (s)	6.0	6.1						6.0	6.0				
Vehicle Extension (s)	3.0	3.0						3.0	3.0				
Lane Grp Cap (vph)	747	2195						319	169				
v/s Ratio Prot	c0.49	c0.82						c0.11					
v/s Ratio Perm									0.04				
v/c Ratio	1.18	1.01						1.02	0.40				
Uniform Delay, d1	41.0	13.5						62.5	58.3				
Progression Factor	1.00	1.00						1.00	1.00				
Incremental Delay, d2	96.3	22.6						56.1	1.6				
Delay (s)	137.3	36.2						118.6	59.9				
Level of Service	F	D						F	E				
Approach Delay (s)		69.4			0.0			101.4			0.0		
Approach LOS		E			A			F			A		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			73.3									HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio			1.12										
Actuated Cycle Length (s)			140.0									Sum of lost time (s)	18.6
Intersection Capacity Utilization			109.4%									ICU Level of Service	H
Analysis Period (min)			15										
c Critical Lane Group													

# Queues

## 114: Florida Ave & Channelside Dr

01/19/2022



Lane Group	EBL	EBT	NBT	NBR
Lane Group Flow (vph)	1095	2241	326	135
v/c Ratio	1.14	1.01	1.02	0.57
Control Delay	103.0	36.3	116.5	37.7
Queue Delay	0.8	0.0	10.5	0.0
Total Delay	103.8	36.3	126.9	37.7
Queue Length 50th (ft)	~944	~1263	~196	52
Queue Length 95th (ft)	#1205	#1565	#318	124
Internal Link Dist (ft)		1290	1157	
Turn Bay Length (ft)				200
Base Capacity (vph)	958	2212	319	236
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	135	0	10	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.33	1.01	1.06	0.57






















### Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.

# HCM Signalized Intersection Capacity Analysis

## 115: Morgan St & Channelside Dr

01/19/2022

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	342	1264	54	204	0	771	0	153	4	14	59	0	
Future Volume (vph)	342	1264	54	204	0	771	0	153	4	14	59	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	5.5	6.2		5.9		5.9		5.9	5.9	5.9	5.9		
Lane Util. Factor	1.00	0.95		1.00		1.00		1.00	1.00	1.00	1.00		
Frt	1.00	0.99		1.00		0.85		1.00	0.85	1.00	1.00		
Flt Protected	0.95	1.00		0.95		1.00		1.00	1.00	0.95	1.00		
Satd. Flow (prot)	1770	3517		1770		1583		1863	1583	1770	1863		
Flt Permitted	0.95	1.00		0.19		1.00		1.00	1.00	0.49	1.00		
Satd. Flow (perm)	1770	3517		346		1583		1863	1583	919	1863		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	372	1374	59	222	0	838	0	166	4	15	64	0	
RTOR Reduction (vph)	0	2	0	0	0	87	0	0	3	0	0	0	
Lane Group Flow (vph)	372	1431	0	222	0	751	0	166	1	15	64	0	
Turn Type	pm+pt	NA		Perm		Perm		NA	Perm	Perm	NA		
Protected Phases	1	6						4				8	
Permitted Phases	6			2		2			4	8			
Actuated Green, G (s)	103.8	103.8		83.5		83.5		24.1	24.1	24.1	24.1		
Effective Green, g (s)	103.8	103.8		83.5		83.5		24.1	24.1	24.1	24.1		
Actuated g/C Ratio	0.74	0.74		0.60		0.60		0.17	0.17	0.17	0.17		
Clearance Time (s)	5.5	6.2		5.9		5.9		5.9	5.9	5.9	5.9		
Vehicle Extension (s)	3.0	3.0		3.0		3.0		3.0	3.0	3.0	3.0		
Lane Grp Cap (vph)	1312	2607		206		944		320	272	158	320		
v/s Ratio Prot	0.03	c0.41						c0.09			0.03		
v/s Ratio Perm	0.18			c0.64		0.47			0.00	0.02			
v/c Ratio	0.28	0.55		1.08		0.80		0.52	0.00	0.09	0.20		
Uniform Delay, d1	5.9	7.9		28.2		21.7		52.7	48.0	48.8	49.7		
Progression Factor	0.71	0.60		0.86		1.01		1.00	1.00	0.45	0.42		
Incremental Delay, d2	0.0	0.2		43.7		0.7		5.9	0.0	1.0	1.2		
Delay (s)	4.2	4.9		68.0		22.6		58.6	48.0	23.1	22.0		
Level of Service	A	A		E		C		E	D	C	C		
Approach Delay (s)		4.8			32.1			58.3			22.2		
Approach LOS		A			C			E			C		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			17.5									HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.91										
Actuated Cycle Length (s)			140.0									Sum of lost time (s)	17.3
Intersection Capacity Utilization			89.4%									ICU Level of Service	E
Analysis Period (min)			15										

c Critical Lane Group

Queues

115: Morgan St & Channelside Dr

01/19/2022



Lane Group	EBL	EBT	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	372	1433	222	838	166	4	15	64
v/c Ratio	0.28	0.55	1.08	0.81	0.52	0.01	0.09	0.20
Control Delay	4.2	5.0	71.0	18.0	59.2	0.0	23.4	22.2
Queue Delay	0.6	1.0	0.0	50.5	0.0	0.0	0.1	0.0
Total Delay	4.9	5.9	71.0	68.5	59.2	0.0	23.6	22.2
Queue Length 50th (ft)	59	124	~220	270	139	0	5	22
Queue Length 95th (ft)	m64	m132	m#196	m234	216	0	m10	m51
Internal Link Dist (ft)		523			1253			424
Turn Bay Length (ft)	450			10			100	
Base Capacity (vph)	1321	2610	206	1031	320	328	158	320
Starvation Cap Reductn	598	824	0	179	0	0	0	0
Spillback Cap Reductn	423	373	0	378	0	0	26	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.80	1.08	1.28	0.52	0.01	0.11	0.20

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary  
 116: Channelside Dr & Jefferson St

01/19/2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↑	↗		↙	↘
Traffic Volume (veh/h)	527	755	867	143	7	108
Future Volume (veh/h)	527	755	867	143	7	108
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	573	821	942	155	8	117
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	433	1443	806	133	261	232
Arrive On Green	0.07	0.25	1.00	1.00	0.15	0.15
Sat Flow, veh/h	1781	1870	1566	258	1781	1585
Grp Volume(v), veh/h	573	821	0	1097	8	117
Grp Sat Flow(s),veh/h/ln	1781	1870	0	1824	1781	1585
Q Serve(g_s), s	30.0	53.6	0.0	72.0	0.5	9.5
Cycle Q Clear(g_c), s	30.0	53.6	0.0	72.0	0.5	9.5
Prop In Lane	1.00			0.14	1.00	1.00
Lane Grp Cap(c), veh/h	433	1443	0	938	261	232
V/C Ratio(X)	1.32	0.57	0.00	1.17	0.03	0.50
Avail Cap(c_a), veh/h	433	1443	0	938	261	232
HCM Platoon Ratio	0.33	0.33	2.00	2.00	1.00	1.00
Upstream Filter(l)	0.82	0.82	0.00	0.55	0.09	0.09
Uniform Delay (d), s/veh	59.0	31.9	0.0	0.0	51.2	55.1
Incr Delay (d2), s/veh	158.1	1.3	0.0	83.0	0.0	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	35.2	27.5	0.0	21.6	0.2	3.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	217.1	33.2	0.0	83.0	51.3	55.8
LnGrp LOS	F	C	A	F	D	E
Approach Vol, veh/h		1394	1097		125	
Approach Delay, s/veh		108.8	83.0		55.5	
Approach LOS		F	F		E	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	36.0	78.0			114.0	26.0
Change Period (Y+Rc), s	6.0	6.0			6.0	5.5
Max Green Setting (Gmax), s	30.0	72.0			108.0	20.5
Max Q Clear Time (g_c+11), s	32.0	74.0			55.6	11.5
Green Ext Time (p_c), s	0.0	0.0			7.8	0.2
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			95.4			
HCM 6th LOS			F			

Queues

116: Channelside Dr & Jefferson St

01/19/2022



Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	573	821	1097	8	117
v/c Ratio	1.33	0.57	1.16	0.03	0.35
Control Delay	197.0	2.6	109.5	45.9	29.6
Queue Delay	0.4	0.1	0.4	0.0	0.0
Total Delay	197.4	2.7	109.9	45.9	29.6
Queue Length 50th (ft)	~625	11	~1172	8	76
Queue Length 95th (ft)	#868	12	#1442	m7	m55
Internal Link Dist (ft)		315	131	443	
Turn Bay Length (ft)				100	
Base Capacity (vph)	432	1437	943	259	331
Starvation Cap Reductn	17	80	70	0	0
Spillback Cap Reductn	0	88	24	0	1
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.38	0.61	1.26	0.03	0.35

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary  
 117: Channelside Dr & Nebraska Ave

01/19/2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↑	↗		↙	↘
Traffic Volume (veh/h)	132	630	716	203	28	294
Future Volume (veh/h)	132	630	716	203	28	294
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	143	685	778	221	30	320
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	510	1483	1001	284	17	182
Arrive On Green	0.07	1.00	1.00	1.00	0.13	0.13
Sat Flow, veh/h	1781	1870	1401	398	137	1459
Grp Volume(v), veh/h	143	685	0	999	351	0
Grp Sat Flow(s),veh/h/ln	1781	1870	0	1799	1601	0
Q Serve(g_s), s	0.0	0.0	0.0	0.0	17.5	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	17.5	0.0
Prop In Lane	1.00			0.22	0.09	0.91
Lane Grp Cap(c), veh/h	510	1483	0	1285	200	0
V/C Ratio(X)	0.28	0.46	0.00	0.78	1.75	0.00
Avail Cap(c_a), veh/h	510	1483	0	1285	200	0
HCM Platoon Ratio	2.00	2.00	2.00	2.00	1.00	1.00
Upstream Filter(l)	0.80	0.80	0.00	0.41	0.73	0.00
Uniform Delay (d), s/veh	6.2	0.0	0.0	0.0	61.3	0.0
Incr Delay (d2), s/veh	1.1	0.8	0.0	2.0	354.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.3	0.0	0.7	26.8	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	7.3	0.8	0.0	2.0	415.2	0.0
LnGrp LOS	A	A	A	A	F	A
Approach Vol, veh/h		828	999		351	
Approach Delay, s/veh		2.0	2.0		415.2	
Approach LOS		A	A		F	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	11.0	106.0			117.0	23.0
Change Period (Y+Rc), s	6.0	6.0			6.0	5.5
Max Green Setting (Gmax), s	5.0	100.0			111.0	17.5
Max Q Clear Time (g_c+I1), s	2.0	2.0			2.0	19.5
Green Ext Time (p_c), s	0.1	10.9			5.2	0.0
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			68.6			
HCM 6th LOS			E			



# Queues

## 117: Channelside Dr & Nebraska Ave

01/19/2022



Lane Group	EBL	EBT	WBT	SBL
Lane Group Flow (vph)	143	685	999	350
v/c Ratio	0.46	0.46	0.77	0.75
Control Delay	9.2	3.2	6.1	29.3
Queue Delay	2.2	0.4	43.6	62.7
Total Delay	11.4	3.6	49.7	91.9
Queue Length 50th (ft)	7	159	99	145
Queue Length 95th (ft)	34	136	112	219
Internal Link Dist (ft)		131	222	457
Turn Bay Length (ft)	80			
Base Capacity (vph)	313	1477	1298	468
Starvation Cap Reductn	80	349	127	14
Spillback Cap Reductn	0	0	378	275
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.61	0.61	1.09	1.81

### Intersection Summary

HCM 6th Signalized Intersection Summary  
 119: Old Water St & Channelside Dr

01/19/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗		↖	↗	
Traffic Volume (veh/h)	85	548	25	143	870	132	17	53	59	40	16	33
Future Volume (veh/h)	85	548	25	143	870	132	17	53	59	40	16	33
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	92	596	27	155	946	143	18	58	64	43	17	36
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	431	1224	55	803	1287	195	209	118	130	152	78	164
Arrive On Green	0.07	1.00	1.00	0.31	1.00	1.00	0.14	0.14	0.14	0.14	0.14	0.14
Sat Flow, veh/h	1781	1775	80	1781	1587	240	1351	812	897	1269	535	1132
Grp Volume(v), veh/h	92	0	623	155	0	1089	18	0	122	43	0	53
Grp Sat Flow(s),veh/h/ln	1781	0	1856	1781	0	1827	1351	0	1709	1269	0	1667
Q Serve(g_s), s	2.6	0.0	0.0	0.0	0.0	0.0	1.7	0.0	9.2	4.5	0.0	3.9
Cycle Q Clear(g_c), s	2.6	0.0	0.0	0.0	0.0	0.0	5.6	0.0	9.2	13.7	0.0	3.9
Prop In Lane	1.00		0.04	1.00		0.13	1.00		0.52	1.00		0.68
Lane Grp Cap(c), veh/h	431	0	1279	803	0	1481	209	0	248	152	0	242
V/C Ratio(X)	0.21	0.00	0.49	0.19	0.00	0.74	0.09	0.00	0.49	0.28	0.00	0.22
Avail Cap(c_a), veh/h	431	0	1279	803	0	1481	209	0	248	152	0	242
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.81	0.00	0.81	0.09	0.00	0.09	1.00	0.00	1.00	0.86	0.00	0.86
Uniform Delay (d), s/veh	8.2	0.0	0.0	4.3	0.0	0.0	55.3	0.0	55.1	61.4	0.0	52.9
Incr Delay (d2), s/veh	0.9	0.0	1.1	0.0	0.0	0.3	0.8	0.0	6.8	4.0	0.0	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	0.4	1.0	0.0	0.1	0.6	0.0	4.5	1.6	0.0	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.1	0.0	1.1	4.3	0.0	0.3	56.1	0.0	61.9	65.4	0.0	54.6
LnGrp LOS	A	A	A	A	A	A	E	A	E	E	A	D
Approach Vol, veh/h		715			1244			140				96
Approach Delay, s/veh		2.1			0.8			61.2				59.5
Approach LOS		A			A			E				E
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.0	120.5		26.0	28.5	103.0		26.0				
Change Period (Y+Rc), s	6.0	6.5		* 5.7	6.5	* 6.5		* 5.7				
Max Green Setting (Gmax), s	5.0	96.5		* 20	5.0	* 97		* 20				
Max Q Clear Time (g_c+I1), s	4.6	2.0		11.2	2.0	2.0		15.7				
Green Ext Time (p_c), s	0.0	15.2		0.6	0.1	5.1		0.2				

Intersection Summary

HCM 6th Ctrl Delay	7.6
HCM 6th LOS	A

Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Queues

119: Old Water St & Channelside Dr

01/19/2022



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	92	623	155	1089	18	122	43	53
v/c Ratio	0.59	0.49	0.28	0.86	0.09	0.44	0.28	0.19
Control Delay	35.4	4.8	12.8	26.8	53.4	45.1	62.2	28.9
Queue Delay	0.0	0.2	0.0	48.6	0.0	0.0	0.0	0.0
Total Delay	35.4	5.1	12.8	75.4	53.4	45.1	62.2	28.9
Queue Length 50th (ft)	10	63	63	634	14	74	0	10
Queue Length 95th (ft)	m64	72	m51	m459	39	141	m75	m54
Internal Link Dist (ft)		222		393		1129		462
Turn Bay Length (ft)	80		100				150	
Base Capacity (vph)	157	1276	556	1261	195	277	156	273
Starvation Cap Reductn	0	183	0	417	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.57	0.28	1.29	0.09	0.44	0.28	0.19

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis  
 118: Beneficial Dr/Meridian Ave & Channelside Dr

01/19/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	256	380	11	99	571	80	187	586	67	160	452	387
Future Volume (vph)	256	380	11	99	571	80	187	586	67	160	452	387
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.2		6.2	6.2		6.4	6.4	6.4	6.4	6.4	6.4
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1855		1770	1828		1770	1863	1583	1770	1863	1583
Flt Permitted	0.09	1.00		0.51	1.00		0.10	1.00	1.00	0.12	1.00	1.00
Satd. Flow (perm)	166	1855		958	1828		191	1863	1583	229	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	278	413	12	108	621	87	203	637	73	174	491	421
RTOR Reduction (vph)	0	1	0	0	4	0	0	0	49	0	0	242
Lane Group Flow (vph)	278	424	0	108	704	0	203	637	24	174	491	179
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	1	6			2		7	4			8	
Permitted Phases	6			2			4		4	8		8
Actuated Green, G (s)	82.8	82.8		38.8	38.8		44.6	44.6	44.6	32.6	32.6	32.6
Effective Green, g (s)	82.8	82.8		38.8	38.8		44.6	44.6	44.6	32.6	32.6	32.6
Actuated g/C Ratio	0.59	0.59		0.28	0.28		0.32	0.32	0.32	0.23	0.23	0.23
Clearance Time (s)	6.0	6.2		6.2	6.2		6.4	6.4	6.4	6.4	6.4	6.4
Vehicle Extension (s)	2.0	3.0		3.0	3.0		2.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	533	1097		265	506		124	593	504	53	433	368
v/s Ratio Prot	c0.14	0.23			c0.39		0.07	c0.34			0.26	
v/s Ratio Perm	0.17			0.11			0.46		0.02	c0.76		0.11
v/c Ratio	0.52	0.39		0.41	1.39		1.64	1.07	0.05	3.28	1.13	0.49
Uniform Delay, d1	29.6	15.1		41.2	50.6		45.3	47.7	33.0	53.7	53.7	46.4
Progression Factor	0.61	0.48		1.00	1.00		1.00	1.00	1.00	0.40	0.40	0.96
Incremental Delay, d2	3.3	0.9		4.6	188.3		320.1	58.5	0.2	1067.1	82.1	3.8
Delay (s)	21.3	8.2		45.8	238.9		365.4	106.2	33.2	1088.7	103.3	48.2
Level of Service	C	A		D	F		F	F	C	F	F	D
Approach Delay (s)		13.4			213.3			158.0			239.8	
Approach LOS		B			F			F			F	

Intersection Summary

HCM 2000 Control Delay	167.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.66		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	109.6%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Queues

118: Beneficial Dr/Meridian Ave & Channelside Dr

01/19/2022



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	278	425	108	708	203	637	73	174	491	421
v/c Ratio	0.52	0.39	0.41	1.39	1.64	1.07	0.13	3.28	1.13	0.69
Control Delay	19.2	8.3	46.9	224.6	348.5	103.5	8.0	1081.8	105.9	17.3
Queue Delay	0.5	0.5	0.0	0.7	3.9	0.0	0.0	0.0	0.0	31.0
Total Delay	19.7	8.7	46.9	225.3	352.3	103.5	8.0	1081.8	105.9	48.4
Queue Length 50th (ft)	90	103	81	~857	~216	~643	1	~234	~513	256
Queue Length 95th (ft)	172	132	143	#1105	#383	#881	37	m#390	m#736	m431
Internal Link Dist (ft)		393		142		1114			460	
Turn Bay Length (ft)	150		150		300			200		
Base Capacity (vph)	533	1097	265	510	124	593	553	53	433	611
Starvation Cap Reductn	57	301	0	0	0	0	0	0	0	112
Spillback Cap Reductn	0	0	0	41	20	0	0	0	0	203
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.53	0.41	1.51	1.95	1.07	0.13	3.28	1.13	1.03

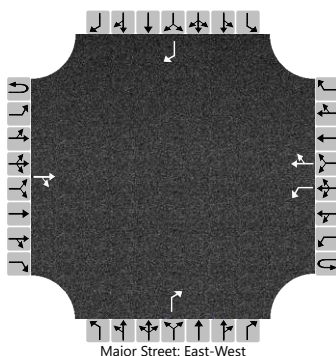
Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

# HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	H.W. Lochner	Intersection	ChannelsideDr&12thSt
Agency/Co.		Jurisdiction	FDOT, District 7
Date Performed	09/24/2021	East/West Street	Channelside Dr
Analysis Year	2046	North/South Street	12th St
Time Analyzed	AM Peak Hour	Peak Hour Factor	0.95
Intersection Orientation	East-West	Analysis Time Period (hrs)	1.00
Project Description	Whiting PD&E Study		

## Lanes



## Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	1	0	0	1	1	0		0	0	1		0	0	1
Configuration				TR		L		TR				R				R
Volume (veh/h)			394	213		12	496	3				119				254
Percent Heavy Vehicles (%)						2						2				2
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized										No				No		
Median Type   Storage	Undivided															

## Critical and Follow-up Headways

Base Critical Headway (sec)					4.1							6.2				6.2
Critical Headway (sec)					4.12							6.22				6.22
Base Follow-Up Headway (sec)					2.2							3.3				3.3
Follow-Up Headway (sec)					2.22							3.32				3.32

## Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)					13							125				267			
Capacity, c (veh/h)					945							551				553			
v/c Ratio					0.01							0.23				0.48			
95% Queue Length, Q <sub>95</sub> (veh)					0.0							0.9				2.8			
Control Delay (s/veh)					8.9							13.4				17.5			
Level of Service (LOS)					A							B				C			
Approach Delay (s/veh)					0.2							13.4				17.5			
Approach LOS					A							B				C			

# MOVEMENT SUMMARY

**Site: 8 [Channelside Drive at Cumberland Avenue\_Build2046-AM (Site Folder: General)]**

Build 2046 Year -  
 AM Peak Hour  
 Site Category: (None)  
 Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
		[ Total veh/h ]	[ HV % ]	[ Total veh/h ]	[ HV % ]				[ Veh. veh ]	[ Dist ft ]				
South: Channelside Drive														
3	L2	94	2.0	99	2.0	0.508	8.6	LOS A	3.1	78.3	0.45	0.31	0.45	36.1
8	T1	453	2.0	477	2.0	0.508	8.6	LOS A	3.1	78.3	0.45	0.31	0.45	36.8
18	R2	29	2.0	31	2.0	0.508	8.6	LOS A	3.1	78.3	0.45	0.31	0.45	35.6
Approach		576	2.0	606	2.0	0.508	8.6	LOS A	3.1	78.3	0.45	0.31	0.45	36.6
East: E Cumberland Avenue														
1	L2	9	2.0	9	2.0	0.081	5.2	LOS A	0.3	7.2	0.51	0.45	0.51	39.2
6	T1	5	2.0	5	2.0	0.081	5.2	LOS A	0.3	7.2	0.51	0.45	0.51	36.4
16	R2	49	2.0	52	2.0	0.081	5.2	LOS A	0.3	7.2	0.51	0.45	0.51	36.2
Approach		63	2.0	66	2.0	0.081	5.2	LOS A	0.3	7.2	0.51	0.45	0.51	36.6
North: Channelside Drive														
7	L2	61	2.0	64	2.0	0.466	7.6	LOS A	2.8	70.6	0.35	0.20	0.35	36.4
4	T1	497	2.0	523	2.0	0.466	7.6	LOS A	2.8	70.6	0.35	0.20	0.35	38.0
14	R2	230	2.0	242	2.0	0.204	4.8	LOS A	0.9	22.6	0.26	0.14	0.26	34.5
Approach		788	2.0	829	2.0	0.466	6.8	LOS A	2.8	70.6	0.32	0.18	0.32	36.8
West: E Cumberland Avenue														
5	L2	40	2.0	42	2.0	0.147	5.8	LOS A	0.5	13.7	0.52	0.49	0.52	34.5
2	T1	67	2.0	71	2.0	0.147	5.8	LOS A	0.5	13.7	0.52	0.49	0.52	34.3
12	R2	9	2.0	9	2.0	0.147	5.8	LOS A	0.5	13.7	0.52	0.49	0.52	33.2
Approach		116	2.0	122	2.0	0.147	5.8	LOS A	0.5	13.7	0.52	0.49	0.52	34.3
All Vehicles		1543	2.0	1624	2.0	0.508	7.3	LOS A	3.1	78.3	0.39	0.26	0.39	36.5

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# HCS7 Two-Way Stop-Control Report

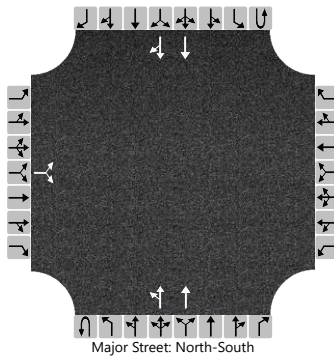
## General Information

Analyst	H.W. Lochner
Agency/Co.	
Date Performed	09/24/2021
Analysis Year	2046
Time Analyzed	AM Peak Hour
Intersection Orientation	North-South
Project Description	Whiting PD&E Study

## Site Information

Intersection	ChannelsideDr&E WhitingSt
Jurisdiction	FDOT, District 7
East/West Street	E Whiting St
North/South Street	Channelside Dr
Peak Hour Factor	0.95
Analysis Time Period (hrs)	1.00

## Lanes



## Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound				
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Movement																	
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6	
Number of Lanes		0	1	0		0	0	0		0	2	0		0	2	0	
Configuration			LR							LT	T				T	TR	
Volume (veh/h)		31		1						42	500				786	72	
Percent Heavy Vehicles (%)		2		2						2							
Proportion Time Blocked																	
Percent Grade (%)		0															
Right Turn Channelized																	
Median Type   Storage		Undivided															

## Critical and Follow-up Headways

Base Critical Headway (sec)		7.5		6.9						4.1						
Critical Headway (sec)		6.84		6.94						4.14						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.52		3.32						2.22						

## Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			34							44								
Capacity, c (veh/h)			162							749								
v/c Ratio			0.21							0.06								
95% Queue Length, Q <sub>95</sub> (veh)			0.8							0.2								
Control Delay (s/veh)			32.9							10.1								
Level of Service (LOS)			D							B								
Approach Delay (s/veh)		32.9									1.1							
Approach LOS		D									B							



HCM Signalized Intersection Capacity Analysis  
 130: Channelside Dr & E Washington St/E York St

01/19/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔	↔	↕		↔	↕	
Traffic Volume (vph)	15	112	5	11	5	82	5	520	9	58	838	170
Future Volume (vph)	15	112	5	11	5	82	5	520	9	58	838	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.9			8.4	8.4	6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frt		1.00			1.00	0.85	1.00	1.00		1.00	0.97	
Flt Protected		0.99			0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1844			1799	1583	1770	3530		1770	3450	
Flt Permitted		0.27			0.70	1.00	0.26	1.00		0.95	1.00	
Satd. Flow (perm)		506			1308	1583	485	3530		1770	3450	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	16	122	5	12	5	89	5	565	10	63	911	185
RTOR Reduction (vph)	0	1	0	0	0	84	0	1	0	0	10	0
Lane Group Flow (vph)	0	142	0	0	17	5	5	574	0	63	1086	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Prot	NA	
Protected Phases		4			3			2		1	1 2	
Permitted Phases	4			3		3	2					
Actuated Green, G (s)		23.1			8.3	8.3	60.2	60.2		22.1	88.3	
Effective Green, g (s)		23.1			8.3	8.3	60.2	60.2		22.1	88.3	
Actuated g/C Ratio		0.17			0.06	0.06	0.43	0.43		0.16	0.63	
Clearance Time (s)		5.9			8.4	8.4	6.0	6.0		6.0		
Vehicle Extension (s)		2.0			4.0	4.0	3.0	3.0		2.0		
Lane Grp Cap (vph)		83			77	93	208	1517		279	2175	
v/s Ratio Prot								0.16		0.04	c0.31	
v/s Ratio Perm		c0.28			c0.01	0.00	0.01					
v/c Ratio		1.71			0.22	0.06	0.02	0.38		0.23	0.50	
Uniform Delay, d1		58.5			62.8	62.2	23.0	27.2		51.5	13.9	
Progression Factor		0.80			1.00	1.00	1.00	1.00		0.96	2.26	
Incremental Delay, d2		364.0			2.0	0.3	0.2	0.7		0.1	0.0	
Delay (s)		411.1			64.7	62.5	23.2	27.9		49.3	31.6	
Level of Service		F			E	E	C	C		D	C	
Approach Delay (s)		411.1			62.9			27.8			32.5	
Approach LOS		F			E			C			C	

Intersection Summary

HCM 2000 Control Delay	60.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.3
Intersection Capacity Utilization	65.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Queues

130: Channelside Dr & E Washington St/E York St

01/19/2022


























Lane Group	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	143	17	89	5	575	63	1096
v/c Ratio	1.70	0.22	0.44	0.02	0.38	0.23	0.50
Control Delay	389.8	68.9	11.5	23.8	28.0	51.2	31.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.5
Total Delay	389.8	68.9	11.5	23.8	28.0	51.2	32.3
Queue Length 50th (ft)	~188	15	0	3	185	60	341
Queue Length 95th (ft)	#332	41	31	12	234	m70	m391
Internal Link Dist (ft)	927	832			494		591
Turn Bay Length (ft)			430	160		280	
Base Capacity (vph)	84	201	342	208	1518	279	2186
Starvation Cap Reductn	0	0	0	0	0	0	604
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.70	0.08	0.26	0.02	0.38	0.23	0.69

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis  
129: Channelside Dr & Kennedy Blvd

01/19/2022

														
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations														
Traffic Volume (vph)	462	59	74	18	36	11	82	500	35	40	985	1181		
Future Volume (vph)	462	59	74	18	36	11	82	500	35	40	985	1181		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900		
Total Lost time (s)	6.3	6.3	6.3		6.8	6.8	6.3	6.3		6.3	6.3	6.3		
Lane Util. Factor	0.95	0.95	1.00		1.00	1.00	1.00	0.95		1.00	0.95	1.00		
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.99		1.00	1.00	0.85		
Flt Protected	0.95	0.96	1.00		0.98	1.00	0.95	1.00		0.95	1.00	1.00		
Satd. Flow (prot)	1681	1704	1583		1832	1583	1770	3504		1770	3539	1583		
Flt Permitted	0.95	0.96	1.00		0.77	1.00	0.09	1.00		0.30	1.00	1.00		
Satd. Flow (perm)	1681	1704	1583		1434	1583	168	3504		565	3539	1583		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92		
Adj. Flow (vph)	502	64	80	20	39	12	89	543	38	43	1071	1284		
RTOR Reduction (vph)	0	0	62	0	0	11	0	3	0	0	0	688		
Lane Group Flow (vph)	281	285	18	0	59	1	89	578	0	43	1071	596		
Turn Type	Split	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm		
Protected Phases	3	3			1			2			2			
Permitted Phases			3	1		1	2			2		2		
Actuated Green, G (s)	30.8	30.8	30.8		9.8	9.8	44.3	44.3		44.3	44.3	44.3		
Effective Green, g (s)	30.8	30.8	30.8		9.8	9.8	44.3	44.3		44.3	44.3	44.3		
Actuated g/C Ratio	0.22	0.22	0.22		0.07	0.07	0.32	0.32		0.32	0.32	0.32		
Clearance Time (s)	6.3	6.3	6.3		6.8	6.8	6.3	6.3		6.3	6.3	6.3		
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	3.0		
Lane Grp Cap (vph)	369	374	348		100	110	53	1108		178	1119	500		
v/s Ratio Prot	0.17	c0.17						0.16			0.30			
v/s Ratio Perm			0.01		c0.04	0.00	c0.53			0.08		0.38		
v/c Ratio	0.76	0.76	0.05		0.59	0.01	1.68	0.52		0.24	0.96	1.19		
Uniform Delay, d1	51.2	51.2	43.1		63.2	60.6	47.9	39.2		35.4	46.9	47.9		
Progression Factor	1.00	1.00	1.00		1.00	1.00	0.53	0.43		1.00	1.00	1.00		
Incremental Delay, d2	9.0	8.9	0.1		8.6	0.0	370.5	1.6		3.2	18.4	105.1		
Delay (s)	60.1	60.0	43.1		71.8	60.6	395.9	18.6		38.6	65.3	152.9		
Level of Service	E	E	D		E	E	F	B		D	E	F		
Approach Delay (s)		58.0			69.9			68.7			111.7			
Approach LOS		E			E			E			F			
<b>Intersection Summary</b>														
HCM 2000 Control Delay			94.2									HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio			0.88											
Actuated Cycle Length (s)			140.0								22.4			
Intersection Capacity Utilization			106.0%										ICU Level of Service	G
Analysis Period (min)			15											

c Critical Lane Group

Queues

129: Channelside Dr & Kennedy Blvd

01/19/2022



Lane Group	EBL	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	281	285	80	59	12	89	581	43	1071	1284
v/c Ratio	0.76	0.76	0.19	0.53	0.06	1.65	0.51	0.23	0.93	1.08
Control Delay	63.8	63.7	4.4	77.5	0.5	381.0	17.9	38.8	59.6	59.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.8	63.7	4.4	77.5	0.5	381.0	17.9	38.8	59.6	59.4
Queue Length 50th (ft)	253	257	0	53	0	~116	224	29	495	~641
Queue Length 95th (ft)	330	333	25	99	0	m#222	m282	64	#628	#912
Internal Link Dist (ft)		906		876			591		1242	
Turn Bay Length (ft)			140			280		75		375
Base Capacity (vph)	656	665	680	156	260	54	1147	184	1155	1194
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.43	0.12	0.38	0.05	1.65	0.51	0.23	0.93	1.08

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

# HCM Signalized Intersection Capacity Analysis

## 113: Florida Ave & Selmon Expy Off-Ramp

01/19/2022



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↑↑↑	↑↑			
Traffic Volume (vph)	0	1234	1338	0	0	0
Future Volume (vph)	0	1234	1338	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.6	6.0			
Lane Util. Factor		0.76	0.95			
Frt		0.85	1.00			
Flt Protected		1.00	1.00			
Satd. Flow (prot)		3610	3539			
Flt Permitted		1.00	1.00			
Satd. Flow (perm)		3610	3539			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1341	1454	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	1341	1454	0	0	0
Turn Type		Prot	NA			
Protected Phases		2	1 4			
Permitted Phases						
Actuated Green, G (s)		48.4	79.0			
Effective Green, g (s)		48.4	79.0			
Actuated g/C Ratio		0.35	0.56			
Clearance Time (s)		6.6				
Vehicle Extension (s)		3.0				
Lane Grp Cap (vph)		1248	1997			
v/s Ratio Prot		c0.37	c0.41			
v/s Ratio Perm						
v/c Ratio		1.07	0.73			
Uniform Delay, d1		45.8	22.6			
Progression Factor		1.00	0.33			
Incremental Delay, d2		48.0	0.1			
Delay (s)		93.8	7.6			
Level of Service		F	A			
Approach Delay (s)	93.8		7.6		0.0	
Approach LOS	F		A		A	

### Intersection Summary

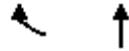
HCM 2000 Control Delay	49.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	111.9%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

# Queues

## 113: Florida Ave & Selmon Expy Off-Ramp

01/19/2022



Lane Group	WBR	NBT
Lane Group Flow (vph)	1341	1454
v/c Ratio	1.07	0.73
Control Delay	91.4	7.8
Queue Delay	0.0	0.0
Total Delay	91.4	7.8
Queue Length 50th (ft)	~594	303
Queue Length 95th (ft)	#710	m127
Internal Link Dist (ft)		1
Turn Bay Length (ft)	350	
Base Capacity (vph)	1248	1997
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	1.07	0.73

### Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

# HCM Signalized Intersection Capacity Analysis

109: Florida Ave & Brorein St

01/19/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations					↑↑↑		↔	↑↑↑					
Traffic Volume (vph)	0	0	0	0	2304	576	302	2318	0	0	0	0	
Future Volume (vph)	0	0	0	0	2304	576	302	2318	0	0	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)					5.8		6.1	6.1					
Lane Util. Factor					0.86		1.00	0.91					
Frt					0.97		1.00	1.00					
Flt Protected					1.00		0.95	1.00					
Satd. Flow (prot)					6216		1770	5085					
Flt Permitted					1.00		0.95	1.00					
Satd. Flow (perm)					6216		1770	5085					
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	0	0	0	0	2504	626	328	2520	0	0	0	0	
RTOR Reduction (vph)	0	0	0	0	19	0	22	0	0	0	0	0	
Lane Group Flow (vph)	0	0	0	0	3111	0	306	2520	0	0	0	0	
Turn Type					NA		Perm	NA					
Protected Phases					2			4					
Permitted Phases							4						
Actuated Green, G (s)					54.2		73.9	73.9					
Effective Green, g (s)					54.2		73.9	73.9					
Actuated g/C Ratio					0.37		0.51	0.51					
Clearance Time (s)					5.8		6.1	6.1					
Vehicle Extension (s)					3.0		3.0	3.0					
Lane Grp Cap (vph)					2323		902	2591					
v/s Ratio Prot					c0.50			c0.50					
v/s Ratio Perm							0.17						
v/c Ratio					1.34		0.34	0.97					
Uniform Delay, d1					45.4		21.1	34.6					
Progression Factor					1.00		1.00	1.00					
Incremental Delay, d2					155.7		1.0	12.3					
Delay (s)					201.1		22.1	46.9					
Level of Service					F		C	D					
Approach Delay (s)		0.0			201.1			44.0			0.0		
Approach LOS		A			F			D			A		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			126.3		HCM 2000 Level of Service				F				
HCM 2000 Volume to Capacity ratio			1.11										
Actuated Cycle Length (s)			145.0		Sum of lost time (s)				14.9				
Intersection Capacity Utilization			97.7%		ICU Level of Service				F				
Analysis Period (min)			15										
c Critical Lane Group													

# Queues

## 109: Florida Ave & Brorein St

01/19/2022



Lane Group	WBT	NBL	NBT
Lane Group Flow (vph)	3130	328	2520
v/c Ratio	1.34	0.36	0.97
Control Delay	190.8	19.5	46.9
Queue Delay	0.0	2.0	42.8
Total Delay	190.8	21.4	89.7
Queue Length 50th (ft)	~1116	155	827
Queue Length 95th (ft)	#1174	227	#963
Internal Link Dist (ft)	416		356
Turn Bay Length (ft)		300	
Base Capacity (vph)	2342	923	2591
Starvation Cap Reductn	0	439	749
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	1.34	0.68	1.37

### Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.



HCM Signalized Intersection Capacity Analysis  
 110: Morgan St & Brorein St & Selmon Expy Off-Ramp

01/19/2022



Movement	WBL	WBT	NBL	NBT	NBR2	SBL	SBT	SBR	SWR	SWR2
Lane Configurations		↕↕	↗	↕	↗	↗	↗		↗	↗
Traffic Volume (vph)	2	2346	346	734	170	560	83	296	1029	635
Future Volume (vph)	2	2346	346	734	170	560	83	296	1029	635
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.7	5.5	6.0	6.0	5.5	6.0		5.7	5.7
Lane Util. Factor		0.95	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt		1.00	1.00	1.00	0.85	1.00	0.88		1.00	0.85
Flt Protected		1.00	0.95	1.00	1.00	0.95	1.00		1.00	1.00
Satd. Flow (prot)		3539	1770	1863	1583	1770	1644		1863	1583
Flt Permitted		1.00	0.36	1.00	1.00	0.12	1.00		1.00	1.00
Satd. Flow (perm)		3539	662	1863	1583	215	1644		1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2	2550	376	798	185	609	90	322	1118	690
RTOR Reduction (vph)	0	0	0	0	32	0	13	0	0	147
Lane Group Flow (vph)	0	2552	376	798	153	609	399	0	1118	543
Turn Type	Perm	NA	pm+pt	NA	Perm	pm+pt	NA		Prot	Perm
Protected Phases		2!	7	4		3	8		2!	
Permitted Phases	2		4		4	8				2
Actuated Green, G (s)		46.3	82.0	70.0	70.0	70.5	64.0		46.3	46.3
Effective Green, g (s)		46.3	82.0	70.0	70.0	70.5	64.0		46.3	46.3
Actuated g/C Ratio		0.33	0.59	0.50	0.50	0.50	0.46		0.33	0.33
Clearance Time (s)		5.7	5.5	6.0	6.0	5.5	6.0		5.7	5.7
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		1170	486	931	791	180	751		616	523
v/s Ratio Prot			c0.07	0.43		c0.16	0.24		0.60	
v/s Ratio Perm		0.72	0.38		0.10	c1.55				0.34
v/c Ratio		2.18	0.77	0.86	0.19	3.38	0.53		1.81	1.04
Uniform Delay, d1		46.9	21.3	30.6	19.4	33.8	27.2		46.9	46.9
Progression Factor		0.65	1.03	1.06	0.92	1.47	1.16		1.00	1.00
Incremental Delay, d2		531.8	9.0	8.0	0.4	1080.2	1.5		373.1	49.5
Delay (s)		562.3	30.9	40.5	18.3	1130.0	33.0		420.0	96.3
Level of Service		F	C	D	B	F	C		F	F
Approach Delay (s)		562.3		34.8			687.3			
Approach LOS		F		C			F			

Intersection Summary

HCM 2000 Control Delay	403.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	2.79		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	17.2
Intersection Capacity Utilization	217.4%	ICU Level of Service	H
Analysis Period (min)	15		

! Phase conflict between lane groups.

c Critical Lane Group

Queues

110: Morgan St & Brorein St & Selmon Expy Off-Ramp

01/19/2022



Lane Group	WBT	NBL	NBT	NBR2	SBL	SBT	SWR	SWR2
Lane Group Flow (vph)	2552	376	798	185	609	412	1118	690
v/c Ratio	2.18	0.77	0.86	0.22	3.38	0.54	1.81	1.03
Control Delay	553.1	26.8	41.3	12.2	1094.7	31.7	402.2	73.9
Queue Delay	0.7	6.0	49.4	0.0	0.0	0.7	0.0	0.0
Total Delay	553.8	32.7	90.7	12.2	1094.7	32.4	402.2	73.9
Queue Length 50th (ft)	~2014	160	753	56	~1001	308	~1530	~527
Queue Length 95th (ft)	m#1207	m252	#900	m102	m#1156	m358	#1793	#773
Internal Link Dist (ft)	494		424			563		
Turn Bay Length (ft)		250		10			300	300
Base Capacity (vph)	1170	488	931	823	180	765	616	670
Starvation Cap Reductn	173	70	278	0	0	123	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	2.56	0.90	1.22	0.22	3.38	0.64	1.81	1.03

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

# HCM 6th Signalized Intersection Summary

111: Jefferson St & Brorein St

01/19/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↔		↖	↔		↖	↗	↖
Traffic Volume (veh/h)	211	195	37	23	2190	204	40	423	5	331	550	118
Future Volume (veh/h)	211	195	37	23	2190	204	40	423	5	331	550	118
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	229	212	40	25	2380	222	43	460	5	360	598	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	172	921	174	610	1629	150	121	676	7	274	445	
Arrive On Green	0.07	0.60	0.60	0.66	0.66	0.66	0.04	0.19	0.19	0.12	0.32	0.00
Sat Flow, veh/h	1781	1530	289	1128	3291	302	1781	3601	39	1781	1870	1585
Grp Volume(v), veh/h	229	0	252	25	1268	1334	43	227	238	360	598	0
Grp Sat Flow(s),veh/h/ln	1781	0	1818	1128	1777	1816	1781	1777	1863	1781	1870	1585
Q Serve(g_s), s	9.5	0.0	9.0	1.1	69.3	69.3	2.7	16.6	16.7	12.5	33.3	0.0
Cycle Q Clear(g_c), s	9.5	0.0	9.0	1.1	69.3	69.3	2.7	16.6	16.7	12.5	33.3	0.0
Prop In Lane	1.00		0.16	1.00		0.17	1.00		0.02	1.00		1.00
Lane Grp Cap(c), veh/h	172	0	1095	610	880	899	121	334	350	274	445	
V/C Ratio(X)	1.33	0.00	0.23	0.04	1.44	1.48	0.35	0.68	0.68	1.31	1.34	
Avail Cap(c_a), veh/h	172	0	1095	610	880	899	121	334	350	274	445	
HCM Platoon Ratio	1.00	1.00	1.00	1.33	1.33	1.33	1.00	1.00	1.00	1.33	1.33	1.33
Upstream Filter(I)	0.09	0.00	0.09	0.09	0.09	0.09	0.09	0.09	0.09	1.00	1.00	0.00
Uniform Delay (d), s/veh	46.2	0.0	12.9	12.3	23.9	23.9	45.3	52.9	52.9	47.7	47.9	0.0
Incr Delay (d2), s/veh	151.8	0.0	0.0	0.0	199.2	218.5	0.7	1.0	1.0	164.1	169.3	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.2	0.0	3.7	0.3	73.0	79.4	1.2	7.6	7.9	16.2	35.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	197.9	0.0	12.9	12.3	223.1	242.5	46.0	54.0	53.9	211.8	217.2	0.0
LnGrp LOS	F	A	B	B	F	F	D	D	D	F	F	
Approach Vol, veh/h		481			2627			508			958	A
Approach Delay, s/veh		101.0			230.9			53.3			215.2	
Approach LOS		F			F			D			F	
Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	15.0	75.0	18.0	32.0		90.0	11.0	39.0				
Change Period (Y+Rc), s	5.5	* 5.7	5.5	* 5.7		* 5.7	5.5	* 5.7				
Max Green Setting (Gmax), s	9.5	* 69	12.5	* 26		* 84	5.5	* 33				
Max Q Clear Time (g_c+I1), s	11.5	71.3	14.5	18.7		11.0	4.7	35.3				
Green Ext Time (p_c), s	0.0	0.0	0.0	1.1		1.7	0.0	0.0				

## Intersection Summary

HCM 6th Ctrl Delay	194.2
HCM 6th LOS	F

## Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Queues

111: Jefferson St & Brorein St

01/19/2022



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	229	252	25	2602	43	465	360	598	128
v/c Ratio	1.32	0.23	0.05	1.50	0.35	0.70	1.45	1.35	0.28
Control Delay	178.4	4.0	21.7	253.0	21.5	41.1	250.3	202.8	10.7
Queue Delay	0.0	0.6	0.0	5.1	5.5	0.0	2.1	0.0	0.1
Total Delay	178.4	4.7	21.7	258.0	27.0	41.1	252.4	202.8	10.9
Queue Length 50th (ft)	~215	89	11	~1713	22	222	~360	~699	8
Queue Length 95th (ft)	m64	m10	m10	m#1252	m17	m170	m#547	m#916	m29
Internal Link Dist (ft)		494		148		443		116	
Turn Bay Length (ft)	150		50		100		50		
Base Capacity (vph)	173	1099	555	1734	123	664	249	443	458
Starvation Cap Reductn	0	0	0	351	0	0	0	0	0
Spillback Cap Reductn	0	539	0	1126	44	0	34	0	41
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.32	0.45	0.05	4.28	0.54	0.70	1.67	1.35	0.31

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary  
 112: Nebraska Ave & Brorein St

01/19/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶	↷		↶	↷			↷			↷	
Traffic Volume (veh/h)	81	372	78	3	1932	5	315	89	101	22	231	169
Future Volume (veh/h)	81	372	78	3	1932	5	315	89	101	22	231	169
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	88	404	85	3	2100	5	342	97	110	24	251	184
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	51	742	156	370	1800	4	251	59	67	51	429	303
Arrive On Green	0.66	0.66	0.66	0.99	0.99	0.99	0.42	0.42	0.42	0.42	0.42	0.42
Sat Flow, veh/h	194	1498	315	907	3637	9	494	140	159	56	1013	716
Grp Volume(v), veh/h	88	0	489	3	1026	1079	549	0	0	459	0	0
Grp Sat Flow(s),veh/h/ln	194	0	1814	907	1777	1869	792	0	0	1785	0	0
Q Serve(g_s), s	0.0	0.0	20.1	0.1	69.3	69.3	30.7	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	69.3	0.0	20.1	20.2	69.3	69.3	59.3	0.0	0.0	28.6	0.0	0.0
Prop In Lane	1.00		0.17	1.00		0.00	0.62		0.20	0.05		0.40
Lane Grp Cap(c), veh/h	51	0	898	370	880	925	377	0	0	783	0	0
V/C Ratio(X)	1.71	0.00	0.54	0.01	1.17	1.17	1.45	0.00	0.00	0.59	0.00	0.00
Avail Cap(c_a), veh/h	51	0	898	370	880	925	377	0	0	783	0	0
HCM Platoon Ratio	1.33	1.33	1.33	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.22	0.00	0.22	0.29	0.29	0.29	0.89	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	58.6	0.0	15.5	3.5	0.7	0.7	49.7	0.0	0.0	31.6	0.0	0.0
Incr Delay (d2), s/veh	337.6	0.0	0.5	0.0	78.6	78.9	217.4	0.0	0.0	3.2	0.0	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.6	0.0	7.3	0.0	19.5	20.6	36.5	0.0	0.0	13.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	396.1	0.0	16.0	3.5	79.3	79.6	267.1	0.0	0.0	34.8	0.0	0.0
LnGrp LOS	F	A	B	A	F	F	F	A	A	C	A	A
Approach Vol, veh/h		577			2108			549				459
Approach Delay, s/veh		74.0			79.4			267.1				34.8
Approach LOS		E			E			F				C
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		75.0		65.0		75.0		65.0				
Change Period (Y+Rc), s		* 5.7		* 5.7		* 5.7		* 5.7				
Max Green Setting (Gmax), s		* 69		* 59		* 69		* 59				
Max Q Clear Time (g_c+I1), s		71.3		61.3		71.3		30.6				
Green Ext Time (p_c), s		0.0		0.0		0.0		3.5				

Intersection Summary

HCM 6th Ctrl Delay	100.9
HCM 6th LOS	F

Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# Queues

## 112: Nebraska Ave & Brorein St

01/19/2022



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	88	489	3	2105	549	459
v/c Ratio	1.66	0.54	0.01	1.20	1.56	0.64
Control Delay	351.3	32.4	7.7	113.2	292.9	36.8
Queue Delay	0.0	55.3	0.0	1.2	27.5	68.9
Total Delay	351.3	87.7	7.7	114.3	320.4	105.6
Queue Length 50th (ft)	~109	281	0	~1224	~701	325
Queue Length 95th (ft)	m#120	m234	m1	#1346	#619	449
Internal Link Dist (ft)		148		203	457	414
Turn Bay Length (ft)	50		70			
Base Capacity (vph)	53	903	313	1751	351	715
Starvation Cap Reductn	0	467	0	89	0	0
Spillback Cap Reductn	0	0	0	503	274	564
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.66	1.12	0.01	1.69	7.13	3.04

### Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary  
701: Water St

01/19/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↕	↗	↖	↗		↖	↗	
Traffic Volume (veh/h)	27	212	256	47	1837	115	74	97	32	2	164	24
Future Volume (veh/h)	27	212	256	47	1837	115	74	97	32	2	164	24
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	29	230	278	51	1997	125	80	105	35	2	178	26
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	82	534	645	667	2352	146	218	369	123	195	300	44
Arrive On Green	1.00	1.00	1.00	0.46	0.46	0.46	0.02	0.09	0.09	0.19	0.19	0.19
Sat Flow, veh/h	191	771	932	891	3399	210	1781	1342	447	1249	1595	233
Grp Volume(v), veh/h	29	0	508	51	1034	1088	80	0	140	2	0	204
Grp Sat Flow(s),veh/h/ln	191	0	1703	891	1777	1832	1781	0	1790	1249	0	1828
Q Serve(g_s), s	20.9	0.0	0.0	4.5	71.6	74.0	0.0	0.0	10.2	0.2	0.0	14.3
Cycle Q Clear(g_c), s	95.5	0.0	0.0	4.7	71.6	74.0	0.0	0.0	10.2	10.4	0.0	14.3
Prop In Lane	1.00		0.55	1.00		0.11	1.00		0.25	1.00		0.13
Lane Grp Cap(c), veh/h	82	0	1178	667	1230	1268	218	0	492	195	0	343
V/C Ratio(X)	0.35	0.00	0.43	0.08	0.84	0.86	0.37	0.00	0.28	0.01	0.00	0.59
Avail Cap(c_a), veh/h	82	0	1178	667	1230	1268	218	0	492	195	0	343
HCM Platoon Ratio	1.67	1.67	1.67	0.67	0.67	0.67	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	0.82	0.00	0.82	0.09	0.09	0.09	0.86	0.00	0.86	1.00	0.00	1.00
Uniform Delay (d), s/veh	36.7	0.0	0.0	12.9	30.8	31.4	60.5	0.0	50.8	54.9	0.0	52.0
Incr Delay (d2), s/veh	9.5	0.0	0.9	0.0	0.7	0.8	4.0	0.0	1.2	0.1	0.0	7.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	0.3	0.9	32.3	34.4	3.1	0.0	5.1	0.1	0.0	7.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.2	0.0	0.9	12.9	31.4	32.2	64.5	0.0	52.0	55.0	0.0	59.3
LnGrp LOS	D	A	A	B	C	C	E	A	D	E	A	E
Approach Vol, veh/h		537			2173			220			206	
Approach Delay, s/veh		3.4			31.4			56.6			59.3	
Approach LOS		A			C			E			E	
Timer - Assigned Phs		2		4		6	7	8				
Phs Duration (G+Y+Rc), s		102.8		44.2		102.8	12.2	32.0				
Change Period (Y+Rc), s		* 5.7		* 5.7		* 5.7	* 5.7	* 5.7				
Max Green Setting (Gmax), s		* 90		* 38		* 90	* 6.5	* 26				
Max Q Clear Time (g_c+I1), s		76.0		12.2		97.5	2.0	16.3				
Green Ext Time (p_c), s		12.3		0.8		0.0	0.1	0.8				

Intersection Summary

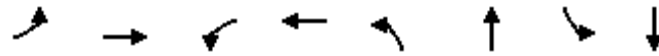
HCM 6th Ctrl Delay	30.2
HCM 6th LOS	C

Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Queues  
701: Water St

01/19/2022



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	29	508	51	2122	80	140	2	204
v/c Ratio	0.56	0.45	0.11	0.94	0.29	0.28	0.01	0.59
Control Delay	45.5	9.7	8.3	17.9	42.0	36.1	46.5	58.4
Queue Delay	0.0	0.5	0.0	45.4	0.0	0.0	0.0	0.0
Total Delay	45.5	10.1	8.3	63.3	42.0	36.1	46.5	58.4
Queue Length 50th (ft)	10	126	13	755	52	87	2	167
Queue Length 95th (ft)	m41	m126	m9	m228	m82	m130	10	254
Internal Link Dist (ft)		203		452		462		361
Turn Bay Length (ft)	70		70		150		150	
Base Capacity (vph)	52	1134	485	2265	276	498	208	347
Starvation Cap Reductn	0	255	0	722	0	0	0	0
Spillback Cap Reductn	0	0	0	549	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.58	0.11	1.38	0.29	0.28	0.01	0.59

Intersection Summary

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



HCM 6th Signalized Intersection Summary  
 120: Meridian Ave & Cumberland Ave

01/19/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔			↔	↔	↔	↕	↕	↔	↕	↕
Traffic Volume (veh/h)	136	64	46	11	449	154	81	750	91	229	942	1485
Future Volume (veh/h)	136	64	46	11	449	154	81	750	91	229	942	1485
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	148	70	50	12	488	0	88	815	99	249	1024	1614
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	160	318	227	33	576		144	1285	156	500	1833	817
Arrive On Green	0.10	0.10	0.10	0.31	0.31	0.00	0.07	0.81	0.81	0.05	0.17	0.17
Sat Flow, veh/h	908	1015	725	20	1841	1585	1781	3190	387	1781	3554	1585
Grp Volume(v), veh/h	148	0	120	500	0	0	88	454	460	249	1024	1614
Grp Sat Flow(s),veh/h/ln	908	0	1740	1861	0	1585	1781	1777	1801	1781	1777	1585
Q Serve(g_s), s	8.5	0.0	8.9	11.0	0.0	0.0	4.1	14.2	14.2	10.0	37.0	72.2
Cycle Q Clear(g_c), s	43.8	0.0	8.9	35.3	0.0	0.0	4.1	14.2	14.2	10.0	37.0	72.2
Prop In Lane	1.00		0.42	0.02		1.00	1.00		0.22	1.00		1.00
Lane Grp Cap(c), veh/h	160	0	544	609	0		144	716	725	500	1833	817
V/C Ratio(X)	0.92	0.00	0.22	0.82	0.00		0.61	0.63	0.63	0.50	0.56	1.97
Avail Cap(c_a), veh/h	160	0	544	609	0		144	716	725	500	1833	817
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	2.00	2.00	2.00	0.33	0.33	0.33
Upstream Filter(I)	0.90	0.00	0.90	1.00	0.00	0.00	0.30	0.30	0.30	0.46	0.46	0.46
Uniform Delay (d), s/veh	73.6	0.0	47.1	45.1	0.0	0.0	27.6	9.5	9.5	19.1	43.5	58.1
Incr Delay (d2), s/veh	50.0	0.0	0.8	11.9	0.0	0.0	5.7	1.3	1.3	1.6	0.6	440.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.8	0.0	4.2	18.4	0.0	0.0	1.9	3.5	3.5	4.7	17.8	130.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	123.6	0.0	47.9	57.0	0.0	0.0	33.3	10.8	10.8	20.7	44.0	498.6
LnGrp LOS	F	A	D	E	A		C	B	B	C	D	F
Approach Vol, veh/h		268			500	A		1002			2887	
Approach Delay, s/veh		89.7			57.0			12.8			296.2	
Approach LOS		F			E			B			F	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.4	78.6		50.0	27.2	62.8		50.0				
Change Period (Y+Rc), s	6.4	6.4		* 6.2	6.4	6.4		* 6.2				
Max Green Setting (Gmax), s	5.0	72.2		* 44	20.8	56.4		* 44				
Max Q Clear Time (g_c+I1), s	6.1	74.2		45.8	12.0	16.2		37.3				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.7	6.4		1.8				

Intersection Summary

HCM 6th Ctrl Delay	197.6
HCM 6th LOS	F

Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.  
 Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Queues

120: Meridian Ave & Cumberland Ave

01/19/2022



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	148	120	500	167	88	914	249	1024	1614
v/c Ratio	1.78	0.21	0.87	0.29	0.36	0.65	0.63	0.56	1.79
Control Delay	422.6	26.6	61.7	11.7	11.5	20.0	20.8	12.5	378.7
Queue Delay	0.0	0.0	0.0	0.0	0.6	1.0	0.0	0.0	1.0
Total Delay	422.6	26.6	61.7	11.7	12.1	21.0	20.8	12.6	379.6
Queue Length 50th (ft)	~206	72	429	26	21	173	74	228	~2232
Queue Length 95th (ft)	#350	133	#621	84	m25	m168	m125	372	#2490
Internal Link Dist (ft)		452	888			460		712	
Turn Bay Length (ft)	100			100	200		250		
Base Capacity (vph)	83	564	578	581	247	1409	397	1825	901
Starvation Cap Reductn	0	0	0	0	0	247	0	0	74
Spillback Cap Reductn	0	0	0	0	36	0	0	36	144
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.78	0.21	0.87	0.29	0.42	0.79	0.63	0.57	2.13





















Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

# HCM Signalized Intersection Capacity Analysis

## 102: Florida Ave & Whiting St

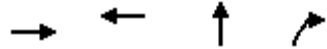
01/19/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 			  				
Traffic Volume (vph)	154	510	0	0	817	202	165	2195	87	0	0	0
Future Volume (vph)	154	510	0	0	817	202	165	2195	87	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			5.7	5.7			
Lane Util. Factor		0.95			0.95			0.91	1.00			
Frt		1.00			0.97			1.00	0.85			
Flt Protected		0.99			1.00			1.00	1.00			
Satd. Flow (prot)		3499			3434			5068	1583			
Flt Permitted		0.51			1.00			1.00	1.00			
Satd. Flow (perm)		1819			3434			5068	1583			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	167	554	0	0	888	220	179	2386	95	0	0	0
RTOR Reduction (vph)	0	0	0	0	16	0	0	0	18	0	0	0
Lane Group Flow (vph)	0	721	0	0	1092	0	0	2565	77	0	0	0
Turn Type	Perm	NA			NA		Perm	NA	Perm			
Protected Phases		4			4			2				
Permitted Phases	4						2		2			
Actuated Green, G (s)		49.0			49.0			74.3	74.3			
Effective Green, g (s)		49.0			49.0			74.3	74.3			
Actuated g/C Ratio		0.35			0.35			0.53	0.53			
Clearance Time (s)		6.0			6.0			5.7	5.7			
Vehicle Extension (s)		3.0			3.0			3.0	3.0			
Lane Grp Cap (vph)		636			1201			2689	840			
v/s Ratio Prot					0.32							
v/s Ratio Perm		c0.40						0.51	0.05			
v/c Ratio		3.15dl			0.91			0.95	0.09			
Uniform Delay, d1		45.5			43.4			31.2	16.2			
Progression Factor		1.00			0.70			1.00	1.00			
Incremental Delay, d2		78.5			1.3			9.5	0.2			
Delay (s)		124.0			31.7			40.7	16.4			
Level of Service		F			C			D	B			
Approach Delay (s)		124.0			31.7			39.9			0.0	
Approach LOS		F			C			D			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			51.4					HCM 2000 Level of Service		D		
HCM 2000 Volume to Capacity ratio			1.00									
Actuated Cycle Length (s)			140.0					Sum of lost time (s)		13.7		
Intersection Capacity Utilization			108.1%					ICU Level of Service		G		
Analysis Period (min)			15									
dl Defacto Left Lane. Recode with 1 though lane as a left lane.												
c Critical Lane Group												

# Queues

## 102: Florida Ave & Whiting St

01/19/2022



Lane Group	EBT	WBT	NBT	NBR
Lane Group Flow (vph)	721	1108	2565	95
v/c Ratio	3.15dl	0.91	0.95	0.11
Control Delay	120.0	31.6	40.9	10.1
Queue Delay	0.0	11.4	44.0	0.0
Total Delay	120.0	43.0	84.9	10.1
Queue Length 50th (ft)	~400	203	788	24
Queue Length 95th (ft)	#530	m94	869	53
Internal Link Dist (ft)	821	519	567	
Turn Bay Length (ft)				100
Base Capacity (vph)	636	1217	2690	858
Starvation Cap Reductn	0	112	468	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.13	1.00	1.15	0.11

### Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.
- dl Defacto Left Lane. Recode with 1 though lane as a left lane.

HCM Signalized Intersection Capacity Analysis  
103: Morgan St & Whiting St

01/19/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	66	150	308	253	934	198	127	683	80	29	568	137
Future Volume (vph)	66	150	308	253	934	198	127	683	80	29	568	137
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.8	5.8		5.8	5.8			5.7			5.7	
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	
Frt	1.00	0.90		1.00	0.97			0.99			0.97	
Flt Protected	0.95	1.00		0.95	1.00			0.99			1.00	
Satd. Flow (prot)	1770	1675		1770	1814			3467			3433	
Flt Permitted	0.12	1.00		0.12	1.00			0.58			0.75	
Satd. Flow (perm)	218	1675		218	1814			2020			2583	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	72	163	335	275	1015	215	138	742	87	32	617	149
RTOR Reduction (vph)	0	53	0	0	5	0	0	6	0	0	14	0
Lane Group Flow (vph)	72	445	0	275	1225	0	0	961	0	0	784	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	4			2			2	
Permitted Phases	4			4			2			2		
Actuated Green, G (s)	34.2	34.2		69.4	34.2			53.3			53.3	
Effective Green, g (s)	34.2	34.2		69.4	34.2			53.3			53.3	
Actuated g/C Ratio	0.24	0.24		0.50	0.24			0.38			0.38	
Clearance Time (s)	5.8	5.8		5.8	5.8			5.7			5.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	53	409		498	443			769			983	
v/s Ratio Prot		0.27		c0.14	c0.68							
v/s Ratio Perm	0.33			0.13				c0.48			0.30	
v/c Ratio	1.36	1.09		0.55	2.76			1.25			0.80	
Uniform Delay, d1	52.9	52.9		29.1	52.9			43.4			38.5	
Progression Factor	0.94	0.90		1.21	0.83			1.29			1.00	
Incremental Delay, d2	189.7	50.7		3.4	799.0			116.6			6.7	
Delay (s)	239.6	98.6		38.5	842.7			172.3			45.3	
Level of Service	F	F		D	F			F			D	
Approach Delay (s)		116.4			695.8			172.3			45.3	
Approach LOS		F			F			F			D	

Intersection Summary

HCM 2000 Control Delay	342.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.47		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	17.3
Intersection Capacity Utilization	134.7%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Queues

103: Morgan St & Whiting St

01/19/2022



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	72	498	275	1230	967	798
v/c Ratio	1.36	1.08	0.55	2.75	1.25	0.80
Control Delay	228.8	84.8	37.5	810.0	160.3	44.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	228.8	84.8	37.5	810.0	160.3	44.7
Queue Length 50th (ft)	~84	~344	163	~1907	~588	330
Queue Length 95th (ft)	m#86	m#183	m208	m#2076	m#650	418
Internal Link Dist (ft)		519		503	563	436
Turn Bay Length (ft)			150			
Base Capacity (vph)	53	462	498	448	775	998
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.36	1.08	0.55	2.75	1.25	0.80

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

# HCM Signalized Intersection Capacity Analysis

## 104: Jefferson St & Whiting St

01/19/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔			↔↔			↔↔			↔↔	
Traffic Volume (vph)	29	120	180	113	651	326	128	232	10	34	750	227
Future Volume (vph)	29	120	180	113	651	326	128	232	10	34	750	227
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.1			6.1			6.1			6.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.92			0.96			1.00			0.97	
Flt Protected		1.00			0.99			0.98			1.00	
Satd. Flow (prot)		3234			3363			3465			3414	
Flt Permitted		0.67			0.82			0.51			0.92	
Satd. Flow (perm)		2189			2760			1783			3149	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	32	130	196	123	708	354	139	252	11	37	815	247
RTOR Reduction (vph)	0	112	0	0	34	0	0	2	0	0	17	0
Lane Group Flow (vph)	0	246	0	0	1151	0	0	400	0	0	1082	0
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA		Perm	NA	
Protected Phases		8		7	4		1	6			2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)		59.9			59.9			62.9			63.0	
Effective Green, g (s)		59.9			59.9			62.9			63.0	
Actuated g/C Ratio		0.43			0.43			0.45			0.45	
Clearance Time (s)		6.1			6.1			6.1			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		936			1180			801			1417	
v/s Ratio Prot												
v/s Ratio Perm		0.11			c0.42			0.22			c0.34	
v/c Ratio		0.26			0.98			1.23dl			0.76	
Uniform Delay, d1		25.8			39.3			27.4			32.3	
Progression Factor		1.99			0.48			0.90			1.00	
Incremental Delay, d2		0.1			19.2			0.4			4.0	
Delay (s)		51.5			38.2			25.0			36.2	
Level of Service		D			D			C			D	
Approach Delay (s)		51.5			38.2			25.0			36.2	
Approach LOS		D			D			C			D	

### Intersection Summary

HCM 2000 Control Delay	37.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	101.3%	ICU Level of Service	G
Analysis Period (min)	15		

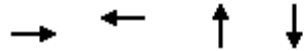
dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group

# Queues

## 104: Jefferson St & Whiting St

01/19/2022



Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	358	1185	402	1099
v/c Ratio	0.34	0.98	1.23dl	0.77
Control Delay	23.5	38.8	26.7	35.7
Queue Delay	0.0	0.3	0.0	0.0
Total Delay	23.5	39.1	26.7	35.7
Queue Length 50th (ft)	84	162	114	424
Queue Length 95th (ft)	m85	#677	m137	515
Internal Link Dist (ft)	503	427	450	207
Turn Bay Length (ft)				
Base Capacity (vph)	1049	1215	803	1434
Starvation Cap Reductn	0	2	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.34	0.98	0.50	0.77

### Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

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

dl Defacto Left Lane. Recode with 1 though lane as a left lane.



# HCM Signalized Intersection Capacity Analysis

## 715: Selmon Expy Off-Ramp & Whiting St

01/19/2022



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	↗↗
Traffic Volume (vph)	167	0	0	879	223	1225
Future Volume (vph)	167	0	0	879	223	1225
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.7			5.7	6.0	6.0
Lane Util. Factor	0.95			0.95	1.00	0.88
Fr <sub>t</sub>	1.00			1.00	1.00	0.85
Fl <sub>t</sub> Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3539			3539	1770	2787
Fl <sub>t</sub> Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3539			3539	1770	2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	182	0	0	955	242	1332
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	182	0	0	955	242	1332
Turn Type	NA			NA	Prot	custom
Protected Phases	5			2	4	4 6
Permitted Phases						
Actuated Green, G (s)	12.8			84.3	44.0	115.5
Effective Green, g (s)	12.8			84.3	44.0	109.8
Actuated g/C Ratio	0.09			0.60	0.31	0.78
Clearance Time (s)	5.7			5.7	6.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	323			2130	556	2185
v/s Ratio Prot	c0.05			0.27	0.14	c0.48
v/s Ratio Perm						
v/c Ratio	0.56			0.45	0.44	0.61
Uniform Delay, d <sub>1</sub>	60.9			15.2	38.1	6.2
Progression Factor	0.95			0.50	1.00	1.00
Incremental Delay, d <sub>2</sub>	2.1			0.4	2.5	1.3
Delay (s)	59.9			8.0	40.6	7.5
Level of Service	E			A	D	A
Approach Delay (s)	59.9			8.0	12.6	
Approach LOS	E			A	B	

### Intersection Summary

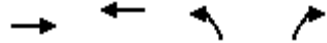
HCM 2000 Control Delay	14.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	17.4
Intersection Capacity Utilization	60.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

# Queues

## 715: Selmon Expy Off-Ramp & Whiting St

01/19/2022



Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	182	955	242	1332
v/c Ratio	0.56	0.45	0.44	0.58
Control Delay	63.8	8.1	41.1	5.5
Queue Delay	0.0	0.5	0.0	0.1
Total Delay	63.8	8.6	41.1	5.6
Queue Length 50th (ft)	77	77	175	184
Queue Length 95th (ft)	m106	m88	258	269
Internal Link Dist (ft)	427	276	783	
Turn Bay Length (ft)			350	350
Base Capacity (vph)	1625	2130	556	2299
Starvation Cap Reductn	0	652	0	0
Spillback Cap Reductn	12	69	0	108
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.11	0.65	0.44	0.61

### Intersection Summary

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

HCM 6th Signalized Intersection Summary  
 11: Water St/Brush St & Whiting St

01/19/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗		↖	↗			↕	
Traffic Volume (veh/h)	281	905	206	152	701	98	34	121	79	68	293	144
Future Volume (veh/h)	281	905	206	152	701	98	34	121	79	68	293	144
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	305	984	224	165	762	107	37	132	86	74	318	157
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	464	1978	926	393	1592	224	176	278	181	64	179	86
Arrive On Green	0.21	1.00	1.00	0.06	0.51	0.51	0.03	0.26	0.26	0.20	0.20	0.20
Sat Flow, veh/h	1781	3554	1585	1781	3129	439	1781	1057	689	180	919	440
Grp Volume(v), veh/h	305	984	224	165	433	436	37	0	218	549	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1791	1781	0	1746	1539	0	0
Q Serve(g_s), s	11.9	0.0	0.0	6.2	22.1	22.1	2.3	0.0	14.7	22.1	0.0	0.0
Cycle Q Clear(g_c), s	11.9	0.0	0.0	6.2	22.1	22.1	2.3	0.0	14.7	27.3	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.25	1.00		0.39	0.13		0.29
Lane Grp Cap(c), veh/h	464	1978	926	393	904	912	176	0	459	329	0	0
V/C Ratio(X)	0.66	0.50	0.24	0.42	0.48	0.48	0.21	0.00	0.47	1.67	0.00	0.00
Avail Cap(c_a), veh/h	826	1978	926	459	904	912	284	0	565	329	0	0
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.79	0.79	0.79	0.57	0.57	0.57	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	13.6	0.0	0.0	14.4	22.3	22.3	41.7	0.0	43.5	58.2	0.0	0.0
Incr Delay (d2), s/veh	1.3	0.7	0.5	0.4	1.0	1.0	0.6	0.0	0.8	313.1	0.0	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	0.2	0.1	2.6	9.5	9.6	1.0	0.0	6.6	40.6	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.9	0.7	0.5	14.8	23.4	23.4	42.3	0.0	44.2	371.3	0.0	0.0
LnGrp LOS	B	A	A	B	C	C	D	A	D	F	A	A
Approach Vol, veh/h		1513			1034			255			549	
Approach Delay, s/veh		3.5			22.0			43.9			371.3	
Approach LOS		A			C			D			F	
Timer - Assigned Phs	1	2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s	20.5	76.9		42.5	13.8	83.6	9.5	33.0				
Change Period (Y+Rc), s	* 5.7	* 5.7		* 5.7	5.5	* 5.7	* 5.7	* 5.7				
Max Green Setting (Gmax), s	* 43	* 34		* 45	13.5	* 64	* 12	* 27				
Max Q Clear Time (g_c+I1), s	13.9	24.1		16.7	8.2	2.0	4.3	29.3				
Green Ext Time (p_c), s	0.9	4.0		1.4	0.2	10.6	0.0	0.0				

Intersection Summary

HCM 6th Ctrl Delay	72.6
HCM 6th LOS	E

Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Queues

11: Water St/Brush St & Whiting St

01/21/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	305	984	224	165	869	37	218	549
v/c Ratio	0.72	0.58	0.23	0.54	0.64	0.21	0.37	1.46
Control Delay	32.1	25.9	2.7	16.2	41.5	35.9	34.3	257.1
Queue Delay	0.2	3.3	0.5	0.0	1.2	0.0	0.0	0.0
Total Delay	32.3	29.2	3.2	16.2	42.8	35.9	34.3	257.1
Queue Length 50th (ft)	151	282	8	67	377	23	135	~676
Queue Length 95th (ft)	253	386	40	m90	m405	51	209	#937
Internal Link Dist (ft)		276			426		126	215
Turn Bay Length (ft)	100		200	300		50		
Base Capacity (vph)	637	1685	1026	337	1364	219	584	377
Starvation Cap Reductn	54	582	465	0	277	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.89	0.40	0.49	0.80	0.17	0.37	1.46

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

# HCM Signalized Intersection Capacity Analysis

## 7: Meridian Ave & Whiting St

01/19/2022



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖↗	↗	↖	↑↑↑	↑↑↑	↗
Traffic Volume (vph)	637	415	339	804	2079	612
Future Volume (vph)	637	415	339	804	2079	612
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	6.9	6.4	6.6	4.0
Lane Util. Factor	0.97	1.00	1.00	0.91	0.86	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3433	1583	1770	5085	6408	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3433	1583	1770	5085	6408	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	692	451	368	874	2260	665
RTOR Reduction (vph)	0	202	0	0	0	0
Lane Group Flow (vph)	692	249	368	874	2260	665
Turn Type	Prot	Perm	Prot	NA	NA	Free
Protected Phases	7 8		1	6	2	
Permitted Phases		7 8				Free
Actuated Green, G (s)	58.9	58.9	21.5	67.0	38.4	140.0
Effective Green, g (s)	58.9	58.9	21.5	67.0	38.4	140.0
Actuated g/C Ratio	0.42	0.42	0.15	0.48	0.27	1.00
Clearance Time (s)			6.9	6.4	6.6	
Vehicle Extension (s)			3.0	3.0	3.0	
Lane Grp Cap (vph)	1444	665	271	2433	1757	1583
v/s Ratio Prot	c0.20		c0.21	0.17	c0.35	
v/s Ratio Perm		0.16				0.42
v/c Ratio	0.48	0.37	1.36	0.36	1.29	0.42
Uniform Delay, d1	29.4	27.9	59.2	23.0	50.8	0.0
Progression Factor	0.61	1.39	0.88	0.16	1.00	1.00
Incremental Delay, d2	0.2	0.3	180.6	0.4	133.3	0.8
Delay (s)	18.2	39.1	232.8	4.0	184.1	0.8
Level of Service	B	D	F	A	F	A
Approach Delay (s)	26.5			71.8	142.4	
Approach LOS	C			E	F	

### Intersection Summary

HCM 2000 Control Delay	100.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.7
Intersection Capacity Utilization	82.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

# Queues

## 7: Meridian Ave & Whiting St

01/21/2022



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	692	451	368	874	2260	665
v/c Ratio	0.46	0.51	1.36	0.36	1.29	0.42
Control Delay	17.7	9.7	221.3	4.1	174.3	0.8
Queue Delay	0.7	1.4	0.0	0.1	0.5	0.0
Total Delay	18.4	11.2	221.3	4.2	174.9	0.9
Queue Length 50th (ft)	232	206	~452	43	~758	0
Queue Length 95th (ft)	m296	m298	m#657	50	#830	0
Internal Link Dist (ft)	426			229	186	
Turn Bay Length (ft)	200	250	150			
Base Capacity (vph)	1581	917	271	2432	1757	1583
Starvation Cap Reductn	531	279	0	558	0	0
Spillback Cap Reductn	0	118	0	0	273	101
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.66	0.71	1.36	0.47	1.52	0.45

### Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

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

HCM Signalized Intersection Capacity Analysis  
 107: Meridian Ave & Whiting St

01/19/2022



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↑↑↑		↔	↑↑↑
Traffic Volume (vph)	193	159	984	56	31	2463
Future Volume (vph)	193	159	984	56	31	2463
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.7		6.4		5.5	6.9
Lane Util. Factor	1.00		0.91		1.00	0.91
Frt	0.94		0.99		1.00	1.00
Flt Protected	0.97		1.00		0.95	1.00
Satd. Flow (prot)	1702		5044		1770	5085
Flt Permitted	0.97		1.00		0.18	1.00
Satd. Flow (perm)	1702		5044		331	5085
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	210	173	1070	61	34	2677
RTOR Reduction (vph)	22	0	4	0	0	0
Lane Group Flow (vph)	361	0	1127	0	34	2677
Turn Type	Prot		NA		custom	NA
Protected Phases	8		6		7	1 2 7
Permitted Phases					1 2	
Actuated Green, G (s)	34.9		67.0		85.3	91.9
Effective Green, g (s)	34.9		67.0		78.4	85.3
Actuated g/C Ratio	0.25		0.48		0.56	0.61
Clearance Time (s)	7.7		6.4		5.5	
Vehicle Extension (s)	3.0		3.0		3.0	
Lane Grp Cap (vph)	424		2413		375	3098
v/s Ratio Prot	c0.21		0.22		0.01	c0.53
v/s Ratio Perm					0.04	
v/c Ratio	0.85		0.47		0.09	0.86
Uniform Delay, d1	50.1		24.5		22.9	22.6
Progression Factor	1.04		1.62		0.31	1.13
Incremental Delay, d2	15.1		0.4		0.0	0.3
Delay (s)	67.2		40.2		7.0	25.8
Level of Service	E		D		A	C
Approach Delay (s)	67.2		40.2			25.6
Approach LOS	E		D			C

Intersection Summary

HCM 2000 Control Delay	33.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.7
Intersection Capacity Utilization	80.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

# Queues

## 107: Meridian Ave & Whiting St

01/19/2022



Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	383	1131	34	2677
v/c Ratio	0.86	0.47	0.09	0.81
Control Delay	66.7	41.1	3.5	22.3
Queue Delay	9.9	0.1	0.0	46.7
Total Delay	76.6	41.2	3.5	68.9
Queue Length 50th (ft)	286	360	2	873
Queue Length 95th (ft)	#423	m384	m3	m656
Internal Link Dist (ft)	878	712		229
Turn Bay Length (ft)				
Base Capacity (vph)	486	2417	394	3285
Starvation Cap Reductn	0	0	0	914
Spillback Cap Reductn	79	301	0	455
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.94	0.53	0.09	1.13

### Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

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



# HCS7 Two-Way Stop-Control Report

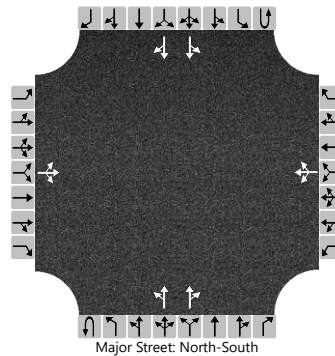
## General Information

Analyst	H.W. Lochner
Agency/Co.	
Date Performed	09/24/2021
Analysis Year	2046
Time Analyzed	AM Peak Hour
Intersection Orientation	North-South
Project Description	Whiting PD&E Study

## Site Information

Intersection	EWashingtonSt&JeffersonSt
Jurisdiction	FDOT, District 7
East/West Street	E Washington St
North/South Street	Jefferson St
Peak Hour Factor	0.95
Analysis Time Period (hrs)	1.00

## Lanes



## Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound				
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Movement																	
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6	
Number of Lanes		0	1	0		0	1	0		0	2	0		0	2	0	
Configuration			LTR				LTR			LT		TR		LT		TR	
Volume (veh/h)		1	35	154		77	67	229		47	540	5		51	780	175	
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2			
Proportion Time Blocked																	
Percent Grade (%)		0				0											
Right Turn Channelized																	
Median Type   Storage		Undivided															

## Critical and Follow-up Headways

Base Critical Headway (sec)		7.5	6.5	6.9		7.5	6.5	6.9		4.1				4.1		
Critical Headway (sec)		7.54	6.54	6.94		7.54	6.54	6.94		4.14				4.14		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.52	4.02	3.32		3.52	4.02	3.32		2.22				2.22		

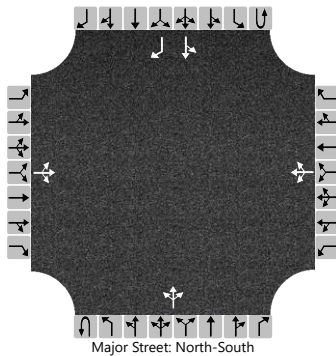
## Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			200				393				49				54	
Capacity, c (veh/h)							125				685				995	
v/c Ratio							3.15				0.07				0.05	
95% Queue Length, Q <sub>95</sub> (veh)							138.2				0.2				0.2	
Control Delay (s/veh)							3937.0				10.7				8.8	
Level of Service (LOS)							F				B				A	
Approach Delay (s/veh)							3937.0				1.3				0.8	
Approach LOS							F									

# HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	H.W. Lochner	Intersection	EWashingtonSt&BrushSt
Agency/Co.		Jurisdiction	FDOT, District 7
Date Performed	09/24/2021	East/West Street	E Washington St
Analysis Year	2046	North/South Street	Brush St
Time Analyzed	AM Peak Hour	Peak Hour Factor	0.95
Intersection Orientation	North-South	Analysis Time Period (hrs)	1.00
Project Description	Whiting PD&E Study		

## Lanes



## Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes	0	1	0	0	0	1	0	0	0	0	1	0	0	0	1	1
Configuration			LTR				LTR				LTR			LT		R
Volume (veh/h)		41	9	48		38	12	1		125	208	34		6	421	174
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized													Yes			
Median Type   Storage	Undivided															

## Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.12	6.52	6.22		7.12	6.52	6.22		4.12				4.12		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.52	4.02	3.32		3.52	4.02	3.32		2.22				2.22		

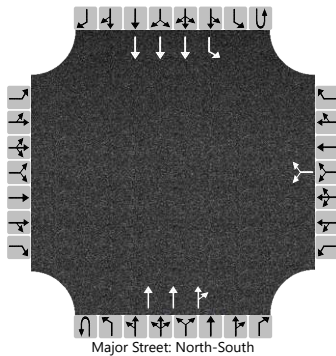
## Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			103				54				132				6	
Capacity, c (veh/h)			302				170				1117				1310	
v/c Ratio			0.34				0.32				0.12				0.00	
95% Queue Length, Q <sub>95</sub> (veh)			1.5				1.4				0.4				0.0	
Control Delay (s/veh)			23.1				35.9				8.7				7.8	
Level of Service (LOS)			C				E				A				A	
Approach Delay (s/veh)	23.1				35.9				3.7				0.1			
Approach LOS	C				E											

# HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	H.W. Lochner	Intersection	MeridianAve&EWashingtonSt
Agency/Co.		Jurisdiction	FDOT, District 7
Date Performed	09/24/2021	East/West Street	Meridian Ave
Analysis Year	2046	North/South Street	E Washington St
Time Analyzed	AM Peak Hour	Peak Hour Factor	0.95
Intersection Orientation	North-South	Analysis Time Period (hrs)	1.00
Project Description	Whiting PD&E Study		

## Lanes



## Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0		0	3	0		0	1	3
Configuration							LR				T	TR		L	T	
Volume (veh/h)						126		186			1258	183		0	7	2565
Percent Heavy Vehicles (%)						2		2						2	2	
Proportion Time Blocked																
Percent Grade (%)							0									
Right Turn Channelized																
Median Type   Storage							Left Only									1

## Critical and Follow-up Headways

















Base Critical Headway (sec)						6.4		7.1							5.3	
Critical Headway (sec)						5.74		7.14							5.34	
Base Follow-Up Headway (sec)						3.8		3.9							3.1	
Follow-Up Headway (sec)						3.82		3.92							3.12	

## Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							328								7	
Capacity, c (veh/h)							163								219	
v/c Ratio							2.01								0.03	
95% Queue Length, Q <sub>95</sub> (veh)							88.1								0.1	
Control Delay (s/veh)							1888.7								22.0	
Level of Service (LOS)							F								C	
Approach Delay (s/veh)							1888.7								0.1	
Approach LOS							F									

HCM Signalized Intersection Capacity Analysis  
 114: Florida Ave & Channelside Dr

01/19/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1162	2493	285	0	0	0	0	619	155	0	0	0
Future Volume (vph)	1162	2493	285	0	0	0	0	619	155	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.1						6.0	6.0			
Lane Util. Factor	*0.51	*0.76						*0.80	1.00			
Frt	1.00	0.98						1.00	0.85			
Flt Protected	0.95	1.00						1.00	1.00			
Satd. Flow (prot)	1805	2788						2980	1583			
Flt Permitted	0.95	1.00						1.00	1.00			
Satd. Flow (perm)	1805	2788						2980	1583			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1263	2710	310	0	0	0	0	673	168	0	0	0
RTOR Reduction (vph)	180	5	0	0	0	0	0	0	62	0	0	0
Lane Group Flow (vph)	1083	3015	0	0	0	0	0	673	106	0	0	0
Turn Type	Prot	NA						NA	Perm			
Protected Phases	1	6						4				
Permitted Phases									4			
Actuated Green, G (s)	64.0	102.9						25.0	25.0			
Effective Green, g (s)	64.0	102.9						25.0	25.0			
Actuated g/C Ratio	0.46	0.74						0.18	0.18			
Clearance Time (s)	6.0	6.1						6.0	6.0			
Vehicle Extension (s)	3.0	3.0						3.0	3.0			
Lane Grp Cap (vph)	825	2049						532	282			
v/s Ratio Prot	0.60	c1.08						c0.23				
v/s Ratio Perm									0.07			
v/c Ratio	1.31	1.47						1.27	0.38			
Uniform Delay, d1	38.0	18.5						57.5	50.6			
Progression Factor	1.00	1.00						1.00	1.00			
Incremental Delay, d2	149.5	214.9						133.7	0.8			
Delay (s)	187.5	233.5						191.2	51.5			
Level of Service	F	F						F	D			
Approach Delay (s)		219.9			0.0			163.3			0.0	
Approach LOS		F			A			F			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			210.6					HCM 2000 Level of Service		F		
HCM 2000 Volume to Capacity ratio			1.51									
Actuated Cycle Length (s)			140.0					Sum of lost time (s)		18.6		
Intersection Capacity Utilization			125.7%					ICU Level of Service		H		
Analysis Period (min)			15									
c Critical Lane Group												

# Queues

## 114: Florida Ave & Channelside Dr

01/19/2022



Lane Group	EBL	EBT	NBT	NBR
Lane Group Flow (vph)	1263	3020	673	168
v/c Ratio	1.26	1.47	1.27	0.49
Control Delay	150.1	235.9	179.5	33.5
Queue Delay	0.5	0.0	0.2	0.0
Total Delay	150.6	235.9	179.6	33.5
Queue Length 50th (ft)	~1245	~2491	~480	75
Queue Length 95th (ft)	#1507	#2630	#630	152
Internal Link Dist (ft)		1290	1157	
Turn Bay Length (ft)				200
Base Capacity (vph)	1004	2054	532	344
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	88	1	10	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.38	1.47	1.29	0.49

### Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis  
 115: Morgan St & Channelside Dr

01/19/2022

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	649	1910	88	18	0	847	0	239	30	1	35	0	
Future Volume (vph)	649	1910	88	18	0	847	0	239	30	1	35	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	5.5	6.2		5.9		5.9		5.9	5.9	5.9	5.9		
Lane Util. Factor	1.00	0.95		1.00		1.00		1.00	1.00	1.00	1.00		
Frt	1.00	0.99		1.00		0.85		1.00	0.85	1.00	1.00		
Flt Protected	0.95	1.00		0.95		1.00		1.00	1.00	0.95	1.00		
Satd. Flow (prot)	1770	3516		1770		1583		1863	1583	1770	1863		
Flt Permitted	0.95	1.00		0.06		1.00		1.00	1.00	0.26	1.00		
Satd. Flow (perm)	1770	3516		109		1583		1863	1583	483	1863		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	705	2076	96	20	0	921	0	260	33	1	38	0	
RTOR Reduction (vph)	0	2	0	0	0	124	0	0	27	0	0	0	
Lane Group Flow (vph)	705	2170	0	20	0	797	0	260	6	1	38	0	
Turn Type	pm+pt	NA		Perm		Perm		NA	Perm	Perm	NA		
Protected Phases	1	6						4				8	
Permitted Phases	6			2		2			4	8			
Actuated Green, G (s)	103.8	103.8		70.2		70.2		24.1	24.1	24.1	24.1		
Effective Green, g (s)	103.8	103.8		70.2		70.2		24.1	24.1	24.1	24.1		
Actuated g/C Ratio	0.74	0.74		0.50		0.50		0.17	0.17	0.17	0.17		
Clearance Time (s)	5.5	6.2		5.9		5.9		5.9	5.9	5.9	5.9		
Vehicle Extension (s)	3.0	3.0		3.0		3.0		3.0	3.0	3.0	3.0		
Lane Grp Cap (vph)	1312	2606		54		793		320	272	83	320		
v/s Ratio Prot	0.11	c0.62						c0.14			0.02		
v/s Ratio Perm	0.29			0.18		c0.50			0.00	0.00			
v/c Ratio	0.54	0.83		0.37		1.00		0.81	0.02	0.01	0.12		
Uniform Delay, d1	7.8	12.2		21.4		34.9		55.8	48.1	48.1	49.0		
Progression Factor	0.43	0.31		0.89		0.91		1.00	1.00	1.36	1.15		
Incremental Delay, d2	0.0	0.3		14.0		28.8		19.8	0.1	0.0	0.1		
Delay (s)	3.4	4.1		33.1		60.6		75.5	48.3	65.5	56.5		
Level of Service	A	A		C		E		E	D	E	E		
Approach Delay (s)		3.9			60.0			72.5			56.8		
Approach LOS		A			E			E			E		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			21.9									HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.95										
Actuated Cycle Length (s)			140.0									Sum of lost time (s)	17.3
Intersection Capacity Utilization			115.4%									ICU Level of Service	H
Analysis Period (min)			15										

c Critical Lane Group

Queues

115: Morgan St & Channelside Dr

01/19/2022



Lane Group	EBL	EBT	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	705	2172	20	921	260	33	1	38
v/c Ratio	0.53	0.83	0.37	1.00	0.81	0.10	0.01	0.12
Control Delay	3.4	4.2	41.0	50.7	75.9	1.2	66.0	57.1
Queue Delay	3.6	46.9	0.0	34.7	36.6	0.0	0.0	0.0
Total Delay	7.0	51.1	41.0	85.4	112.5	1.2	66.0	57.1
Queue Length 50th (ft)	78	134	8	~371	231	0	1	25
Queue Length 95th (ft)	m58	m98	m16	#1030	#370	4	m1	m25
Internal Link Dist (ft)		523			1253			424
Turn Bay Length (ft)	450			10			100	
Base Capacity (vph)	1321	2607	54	918	320	328	82	320
Starvation Cap Reductn	508	700	0	18	0	0	0	0
Spillback Cap Reductn	158	255	0	157	71	4	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.87	1.14	0.37	1.21	1.04	0.10	0.01	0.12

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary  
 116: Channelside Dr & Jefferson St

01/19/2022



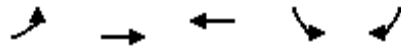
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	167	1774	580	14	7	285
Future Volume (veh/h)	167	1774	580	14	7	285
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	182	1928	630	15	8	310
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	678	1443	936	22	261	232
Arrive On Green	0.07	0.25	0.68	0.68	0.15	0.15
Sat Flow, veh/h	1781	1870	1819	43	1781	1585
Grp Volume(v), veh/h	182	1928	0	645	8	310
Grp Sat Flow(s),veh/h/ln	1781	1870	0	1863	1781	1585
Q Serve(g_s), s	4.5	108.0	0.0	28.4	0.5	20.5
Cycle Q Clear(g_c), s	4.5	108.0	0.0	28.4	0.5	20.5
Prop In Lane	1.00			0.02	1.00	1.00
Lane Grp Cap(c), veh/h	678	1443	0	958	261	232
V/C Ratio(X)	0.27	1.34	0.00	0.67	0.03	1.34
Avail Cap(c_a), veh/h	678	1443	0	958	261	232
HCM Platoon Ratio	0.33	0.33	1.33	1.33	1.00	1.00
Upstream Filter(I)	0.46	0.46	0.00	0.85	0.88	0.88
Uniform Delay (d), s/veh	11.5	52.2	0.0	15.2	51.2	59.8
Incr Delay (d2), s/veh	0.4	153.6	0.0	3.2	0.2	174.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	115.8	0.0	11.0	0.3	19.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	12.0	205.7	0.0	18.5	51.4	234.3
LnGrp LOS	B	F	A	B	D	F
Approach Vol, veh/h		2110	645		318	
Approach Delay, s/veh		189.0	18.5		229.7	
Approach LOS		F	B		F	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	36.0	78.0			114.0	26.0
Change Period (Y+Rc), s	6.0	6.0			6.0	5.5
Max Green Setting (Gmax), s	30.0	72.0			108.0	20.5
Max Q Clear Time (g_c+I1), s	6.5	30.4			110.0	22.5
Green Ext Time (p_c), s	0.5	5.2			0.0	0.0
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			157.4			
HCM 6th LOS			F			



# Queues

## 116: Channelside Dr & Jefferson St

01/19/2022



Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	182	1928	645	8	310
v/c Ratio	0.30	1.34	0.68	0.03	0.62
Control Delay	1.5	175.6	25.5	48.0	35.3
Queue Delay	0.0	0.5	0.7	0.0	35.6
Total Delay	1.5	176.1	26.2	48.0	70.9
Queue Length 50th (ft)	13	~2352	492	7	187
Queue Length 95th (ft)	m13	#2618	636	m16	275
Internal Link Dist (ft)		315	131	443	
Turn Bay Length (ft)				100	
Base Capacity (vph)	602	1437	955	259	496
Starvation Cap Reductn	0	183	96	0	90
Spillback Cap Reductn	0	122	44	0	196
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.30	1.54	0.75	0.03	1.03

### Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

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

HCM 6th Signalized Intersection Summary  
 117: Channelside Dr & Nebraska Ave

01/19/2022



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↶	↷	↶		↶	
Traffic Volume (veh/h)	423	1358	540	73	8	54
Future Volume (veh/h)	423	1358	540	73	8	54
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	460	1476	587	79	9	59
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	654	1483	1153	155	26	172
Arrive On Green	0.07	1.00	1.00	1.00	0.13	0.13
Sat Flow, veh/h	1781	1870	1614	217	210	1378
Grp Volume(v), veh/h	460	1476	0	666	69	0
Grp Sat Flow(s),veh/h/ln	1781	1870	0	1831	1612	0
Q Serve(g_s), s	0.0	0.0	0.0	0.0	5.5	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	5.5	0.0
Prop In Lane	1.00			0.12	0.13	0.86
Lane Grp Cap(c), veh/h	654	1483	0	1308	201	0
V/C Ratio(X)	0.70	1.00	0.00	0.51	0.34	0.00
Avail Cap(c_a), veh/h	654	1483	0	1308	201	0
HCM Platoon Ratio	2.00	2.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.09	0.09	0.00	0.84	0.09	0.00
Uniform Delay (d), s/veh	11.1	0.0	0.0	0.0	56.0	0.0
Incr Delay (d2), s/veh	0.6	6.0	0.0	1.2	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.4	2.5	0.0	0.4	2.3	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	11.7	6.0	0.0	1.2	56.4	0.0
LnGrp LOS	B	A	A	A	E	A
Approach Vol, veh/h		1936	666		69	
Approach Delay, s/veh		7.4	1.2		56.4	
Approach LOS		A	A		E	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	11.0	106.0			117.0	23.0
Change Period (Y+Rc), s	6.0	6.0			6.0	5.5
Max Green Setting (Gmax), s	5.0	100.0			111.0	17.5
Max Q Clear Time (g_c+I1), s	2.0	2.0			2.0	7.5
Green Ext Time (p_c), s	0.5	5.1			38.0	0.1

Intersection Summary

HCM 6th Ctrl Delay	7.1
HCM 6th LOS	A

# Queues

## 117: Channelside Dr & Nebraska Ave

01/19/2022



Lane Group	EBL	EBT	WBT	SBL
Lane Group Flow (vph)	460	1476	666	68
v/c Ratio	0.84	1.00	0.51	0.27
Control Delay	9.9	17.2	9.6	19.5
Queue Delay	52.8	37.4	0.8	0.1
Total Delay	62.8	54.6	10.4	19.6
Queue Length 50th (ft)	16	1435	156	8
Queue Length 95th (ft)	m10	m108	272	m14
Internal Link Dist (ft)		131	222	457
Turn Bay Length (ft)	80			
Base Capacity (vph)	548	1477	1312	255
Starvation Cap Reductn	182	426	247	0
Spillback Cap Reductn	0	200	337	10
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.26	1.40	0.68	0.28

### Intersection Summary

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

HCM 6th Signalized Intersection Summary  
119: Old Water St & Channelside Dr

01/19/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	1276	66	12	455	131	98	39	117	46	19	60
Future Volume (veh/h)	24	1276	66	12	455	131	98	39	117	46	19	60
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	26	1387	72	13	495	142	107	42	127	50	21	65
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	598	1215	63	325	1133	325	180	59	180	109	58	180
Arrive On Green	0.07	1.00	1.00	0.31	1.00	1.00	0.14	0.14	0.14	0.14	0.14	0.14
Sat Flow, veh/h	1781	1762	91	1781	1397	401	1311	409	1238	1216	402	1244
Grp Volume(v), veh/h	26	0	1459	13	0	637	107	0	169	50	0	86
Grp Sat Flow(s),veh/h/ln	1781	0	1854	1781	0	1798	1311	0	1648	1216	0	1646
Q Serve(g_s), s	0.7	0.0	96.5	0.0	0.0	0.0	11.2	0.0	13.7	5.7	0.0	6.6
Cycle Q Clear(g_c), s	0.7	0.0	96.5	0.0	0.0	0.0	17.8	0.0	13.7	19.4	0.0	6.6
Prop In Lane	1.00		0.05	1.00		0.22	1.00		0.75	1.00		0.76
Lane Grp Cap(c), veh/h	598	0	1278	325	0	1458	180	0	239	109	0	239
V/C Ratio(X)	0.04	0.00	1.14	0.04	0.00	0.44	0.60	0.00	0.71	0.46	0.00	0.36
Avail Cap(c_a), veh/h	598	0	1278	325	0	1458	180	0	239	109	0	239
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.17	0.00	0.17	0.09	0.00	0.09	1.00	0.00	1.00	0.69	0.00	0.69
Uniform Delay (d), s/veh	7.9	0.0	0.0	41.1	0.0	0.0	62.0	0.0	57.0	66.3	0.0	54.0
Incr Delay (d2), s/veh	0.0	0.0	65.7	0.0	0.0	0.1	13.7	0.0	16.2	9.3	0.0	2.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	23.3	0.3	0.0	0.0	4.5	0.0	6.8	2.1	0.0	3.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.9	0.0	65.7	41.1	0.0	0.1	75.7	0.0	73.2	75.6	0.0	56.9
LnGrp LOS	A	A	F	D	A	A	E	A	E	E	A	E
Approach Vol, veh/h		1485			650			276			136	
Approach Delay, s/veh		64.7			0.9			74.2			63.8	
Approach LOS		E			A			E			E	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.0	120.5		26.0	28.5	103.0		26.0				
Change Period (Y+Rc), s	6.0	6.5		* 5.7	6.5	* 6.5		* 5.7				
Max Green Setting (Gmax), s	5.0	96.5		* 20	5.0	* 97		* 20				
Max Q Clear Time (g_c+I1), s	2.7	2.0		19.8	2.0	98.5		21.4				
Green Ext Time (p_c), s	0.0	5.4		0.1	0.0	0.0		0.0				

Intersection Summary

HCM 6th Ctrl Delay	49.4
HCM 6th LOS	D

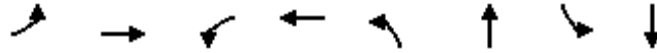
Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Queues

119: Old Water St & Channelside Dr

01/19/2022



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	26	1459	13	637	107	169	50	86
v/c Ratio	0.06	1.14	0.11	0.51	0.58	0.53	0.43	0.29
Control Delay	7.4	83.4	21.8	19.8	69.1	32.3	65.2	22.6
Queue Delay	0.0	2.4	0.0	8.5	1.0	5.8	6.8	0.1
Total Delay	7.4	85.7	21.8	28.3	70.1	38.1	72.0	22.7
Queue Length 50th (ft)	6	~1547	6	348	92	65	41	15
Queue Length 95th (ft)	m6	m#1549	m8	m331	159	142	m53	m36
Internal Link Dist (ft)		222		393		1129		462
Turn Bay Length (ft)	80		100				150	
Base Capacity (vph)	448	1276	115	1248	186	317	117	295
Starvation Cap Reductn	0	6	0	568	0	0	0	0
Spillback Cap Reductn	0	492	0	43	12	98	36	19
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	1.86	0.11	0.94	0.61	0.77	0.62	0.31

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis  
 118: Beneficial Dr/Meridian Ave & Channelside Dr

01/19/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	784	632	23	111	238	130	262	490	135	88	423	98
Future Volume (vph)	784	632	23	111	238	130	262	490	135	88	423	98
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.2		6.2	6.2		6.4	6.4	6.4	6.4	6.4	6.4
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1853		1770	1764		1770	1863	1583	1770	1863	1583
Flt Permitted	0.19	1.00		0.39	1.00		0.10	1.00	1.00	0.16	1.00	1.00
Satd. Flow (perm)	352	1853		735	1764		191	1863	1583	289	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	852	687	25	121	259	141	285	533	147	96	460	107
RTOR Reduction (vph)	0	1	0	0	14	0	0	0	78	0	0	82
Lane Group Flow (vph)	852	711	0	121	386	0	285	533	69	96	460	25
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	1	6			2		7	4			8	
Permitted Phases	6			2			4		4	8		8
Actuated Green, G (s)	82.8	82.8		38.8	38.8		44.6	44.6	44.6	32.6	32.6	32.6
Effective Green, g (s)	82.8	82.8		38.8	38.8		44.6	44.6	44.6	32.6	32.6	32.6
Actuated g/C Ratio	0.59	0.59		0.28	0.28		0.32	0.32	0.32	0.23	0.23	0.23
Clearance Time (s)	6.0	6.2		6.2	6.2		6.4	6.4	6.4	6.4	6.4	6.4
Vehicle Extension (s)	2.0	3.0		3.0	3.0		2.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	593	1095		203	488		124	593	504	67	433	368
v/s Ratio Prot	c0.39	0.38			0.22		c0.09	0.29			0.25	
v/s Ratio Perm	c0.46			0.16			c0.64		0.04	0.33		0.02
v/c Ratio	1.44	0.65		0.60	0.79		2.30	0.90	0.14	1.43	1.06	0.07
Uniform Delay, d1	35.0	19.0		43.8	46.9		45.3	45.5	34.0	53.7	53.7	41.9
Progression Factor	1.00	0.42		1.00	1.00		1.00	1.00	1.00	1.09	1.08	4.82
Incremental Delay, d2	197.4	0.3		12.3	12.4		608.9	19.0	0.6	256.7	59.0	0.3
Delay (s)	232.5	8.2		56.1	59.2		654.2	64.6	34.6	315.2	117.0	202.0
Level of Service	F	A		E	E		F	E	C	F	F	F
Approach Delay (s)		130.4			58.5			234.1			159.4	
Approach LOS		F			E			F			F	

Intersection Summary

HCM 2000 Control Delay	152.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.82		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	121.5%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Queues

118: Beneficial Dr/Meridian Ave & Channelside Dr

01/19/2022



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	852	712	121	400	285	533	147	96	460	107
v/c Ratio	1.44	0.65	0.60	0.80	2.30	0.90	0.25	1.43	1.06	0.23
Control Delay	225.8	8.4	57.8	57.7	630.8	65.0	10.9	297.5	113.0	25.9
Queue Delay	1.7	18.3	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.3
Total Delay	227.5	26.6	57.8	57.7	632.8	65.0	10.9	297.5	113.0	26.2
Queue Length 50th (ft)	~940	222	96	325	~374	464	21	~121	~470	40
Queue Length 95th (ft)	m#790	m192	172	#466	#561	#673	73	#243	#695	107
Internal Link Dist (ft)		393		142		1114			460	
Turn Bay Length (ft)	150		150		300			200		
Base Capacity (vph)	593	1096	203	502	124	593	581	67	433	462
Starvation Cap Reductn	40	386	0	0	0	0	0	0	0	0
Spillback Cap Reductn	117	0	0	1	11	0	0	0	0	96
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.79	1.00	0.60	0.80	2.52	0.90	0.25	1.43	1.06	0.29

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

# HCS7 Two-Way Stop-Control Report

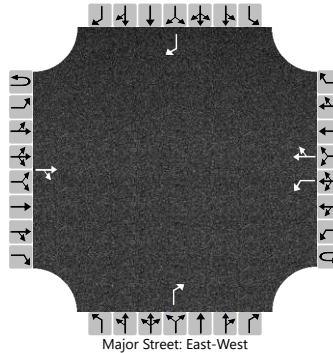
## General Information

Analyst	H.W. Lochner
Agency/Co.	
Date Performed	09/24/2021
Analysis Year	2046
Time Analyzed	PM Peak Hour
Intersection Orientation	East-West
Project Description	Whiting PD&E Study

## Site Information

Intersection	ChannelsideDr&12thSt
Jurisdiction	FDOT, District 7
East/West Street	Channelside Dr
North/South Street	12th St
Peak Hour Factor	0.95
Analysis Time Period (hrs)	1.00

## Lanes



## Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	0	1	0	0	1	1	0		0	0	1		0	0	1
Configuration				TR		L		TR				R				R
Volume (veh/h)			716	139		17	334	25				163				145
Percent Heavy Vehicles (%)						2						2				2
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized										No				No		
Median Type   Storage	Undivided															

## Critical and Follow-up Headways

Base Critical Headway (sec)					4.1							6.2				6.2
Critical Headway (sec)					4.12							6.22				6.22
Base Follow-Up Headway (sec)					2.2							3.3				3.3
Follow-Up Headway (sec)					2.22							3.32				3.32

## Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)					18							172				153				
Capacity, c (veh/h)					755							372				680				
v/c Ratio					0.02							0.46				0.22				
95% Queue Length, Q <sub>95</sub> (veh)					0.1							2.5				0.9				
Control Delay (s/veh)					9.9							22.9				11.8				
Level of Service (LOS)					A							C				B				
Approach Delay (s/veh)					0.4							22.9					11.8			
Approach LOS												C					B			



# MOVEMENT SUMMARY

**Site: 8 [Channelside Drive at Cumberland Avenue\_Build2046-PM (Site Folder: General)]**

Build 2046 Year -  
 PM Peak Hour  
 Site Category: (None)  
 Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h ]	[ HV % ]	[ Total veh/h ]	[ HV % ]				[ Veh. veh ]	[ Dist ft ]				
South: Channelside Drive														
3	L2	123	2.0	129	2.0	0.783	16.7	LOS C	16.9	429.6	0.75	0.70	1.12	32.2
8	T1	748	2.0	787	2.0	0.783	16.7	LOS C	16.9	429.6	0.75	0.70	1.12	32.7
18	R2	25	2.0	26	2.0	0.783	16.7	LOS C	16.9	429.6	0.75	0.70	1.12	31.8
Approach		896	2.0	943	2.0	0.783	16.7	LOS C	16.9	429.6	0.75	0.70	1.12	32.6
East: E Cumberland Avenue														
1	L2	20	2.0	21	2.0	0.190	8.3	LOS A	0.7	16.9	0.63	0.63	0.63	37.1
6	T1	8	2.0	8	2.0	0.190	8.3	LOS A	0.7	16.9	0.63	0.63	0.63	34.6
16	R2	81	2.0	85	2.0	0.190	8.3	LOS A	0.7	16.9	0.63	0.63	0.63	34.4
Approach		109	2.0	115	2.0	0.190	8.3	LOS A	0.7	16.9	0.63	0.63	0.63	34.9
North: Channelside Drive														
7	L2	35	2.0	37	2.0	0.337	6.2	LOS A	1.6	41.8	0.34	0.22	0.34	37.3
4	T1	353	2.0	372	2.0	0.337	6.2	LOS A	1.6	41.8	0.34	0.22	0.34	39.1
14	R2	258	2.0	272	2.0	0.238	5.3	LOS A	1.1	27.1	0.32	0.20	0.32	34.2
Approach		646	2.0	680	2.0	0.337	5.8	LOS A	1.6	41.8	0.34	0.21	0.34	36.9
West: E Cumberland Avenue														
5	L2	46	2.0	48	2.0	0.180	5.5	LOS A	0.7	17.7	0.47	0.40	0.47	34.9
2	T1	78	2.0	82	2.0	0.180	5.5	LOS A	0.7	17.7	0.47	0.40	0.47	34.6
12	R2	40	2.0	42	2.0	0.180	5.5	LOS A	0.7	17.7	0.47	0.40	0.47	33.5
Approach		164	2.0	173	2.0	0.180	5.5	LOS A	0.7	17.7	0.47	0.40	0.47	34.4
All Vehicles		1815	2.0	1911	2.0	0.783	11.3	LOS B	16.9	429.6	0.57	0.49	0.75	34.3

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# HCS7 Two-Way Stop-Control Report

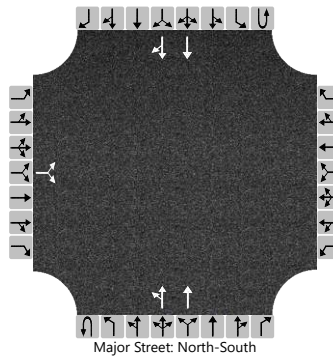
## General Information

Analyst	H.W. Lochner
Agency/Co.	
Date Performed	09/24/2021
Analysis Year	2046
Time Analyzed	PM Peak Hour
Intersection Orientation	North-South
Project Description	Whiting PD&E Study

## Site Information

Intersection	ChannelsideDr&E WhitingSt
Jurisdiction	FDOT, District 7
East/West Street	E Whiting St
North/South Street	Channelside Dr
Peak Hour Factor	0.95
Analysis Time Period (hrs)	1.00

## Lanes



## Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound				
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Movement																	
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6	
Number of Lanes		0	1	0		0	0	0		0	2	0		0	2	0	
Configuration			LR							LT	T				T	TR	
Volume (veh/h)		10		1						53	822				645	65	
Percent Heavy Vehicles (%)		2		2						2							
Proportion Time Blocked																	
Percent Grade (%)		0															
Right Turn Channelized																	
Median Type   Storage		Undivided															

## Critical and Follow-up Headways

Base Critical Headway (sec)		7.5		6.9						4.1						
Critical Headway (sec)		6.84		6.94						4.14						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.52		3.32						2.22						

## Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			12							56								
Capacity, c (veh/h)			153							857								
v/c Ratio			0.08							0.07								
95% Queue Length, Q <sub>95</sub> (veh)			0.2							0.2								
Control Delay (s/veh)			30.4							9.5								
Level of Service (LOS)			D							A								
Approach Delay (s/veh)		30.4									1.1							
Approach LOS		D									A							

HCM Signalized Intersection Capacity Analysis  
 130: Channelside Dr & E Washington St/E York St

01/19/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕↔		↕	↕↔	
Traffic Volume (vph)	19	45	5	18	8	168	5	831	2	72	680	16
Future Volume (vph)	19	45	5	18	8	168	5	831	2	72	680	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.9			8.4	8.4	6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frt		0.99			1.00	0.85	1.00	1.00		1.00	1.00	
Flt Protected		0.99			0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1820			1801	1583	1770	3538		1770	3527	
Flt Permitted		0.21			0.75	1.00	0.36	1.00		0.95	1.00	
Satd. Flow (perm)		394			1392	1583	680	3538		1770	3527	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	21	49	5	20	9	183	5	903	2	78	739	17
RTOR Reduction (vph)	0	2	0	0	0	170	0	0	0	0	1	0
Lane Group Flow (vph)	0	73	0	0	29	13	5	905	0	78	755	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Prot	NA	
Protected Phases		4			3			2		1	1 2	
Permitted Phases	4			3		3	2					
Actuated Green, G (s)		23.1			9.8	9.8	62.9	62.9		17.9	86.8	
Effective Green, g (s)		23.1			9.8	9.8	62.9	62.9		17.9	86.8	
Actuated g/C Ratio		0.17			0.07	0.07	0.45	0.45		0.13	0.62	
Clearance Time (s)		5.9			8.4	8.4	6.0	6.0		6.0		
Vehicle Extension (s)		2.0			4.0	4.0	3.0	3.0		2.0		
Lane Grp Cap (vph)		65			97	110	305	1589		226	2186	
v/s Ratio Prot								c0.26		0.04	c0.21	
v/s Ratio Perm		c0.19			c0.02	0.01	0.01					
v/c Ratio		1.13			0.30	0.12	0.02	0.57		0.35	0.35	
Uniform Delay, d1		58.5			61.8	61.0	21.4	28.5		55.7	12.9	
Progression Factor		0.97			1.00	1.00	1.00	1.00		1.05	1.52	
Incremental Delay, d2		130.9			2.4	0.6	0.1	1.5		0.3	0.0	
Delay (s)		187.7			64.2	61.7	21.5	30.0		58.8	19.6	
Level of Service		F			E	E	C	C		E	B	
Approach Delay (s)		187.7			62.0			30.0			23.3	
Approach LOS		F			E			C			C	

Intersection Summary

HCM 2000 Control Delay	36.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.3
Intersection Capacity Utilization	54.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Queues

130: Channelside Dr & E Washington St/E York St

01/19/2022


























Lane Group	EBT	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	75	29	183	5	905	78	756
v/c Ratio	1.14	0.30	0.65	0.02	0.57	0.35	0.35
Control Delay	181.7	68.3	19.3	23.4	30.8	62.6	20.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	181.7	68.3	19.3	23.4	30.8	62.6	20.6
Queue Length 50th (ft)	~77	26	0	3	326	75	161
Queue Length 95th (ft)	m#135	58	73	12	398	m127	243
Internal Link Dist (ft)	927	832			494		591
Turn Bay Length (ft)			430	160		280	
Base Capacity (vph)	66	214	399	305	1589	226	2188
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	1	0	23	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.14	0.14	0.46	0.02	0.58	0.35	0.35

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis  
129: Channelside Dr & Kennedy Blvd

01/19/2022

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	862	31	84	25	35	74	104	913	5	41	632	519	
Future Volume (vph)	862	31	84	25	35	74	104	913	5	41	632	519	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	6.3	6.3	6.3		6.8	6.8	6.3	6.3		6.3	6.3	6.3	
Lane Util. Factor	0.95	0.95	1.00		1.00	1.00	1.00	0.95		1.00	0.95	1.00	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	1.00		1.00	1.00	0.85	
Flt Protected	0.95	0.96	1.00		0.98	1.00	0.95	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	1681	1691	1583		1825	1583	1770	3537		1770	3539	1583	
Flt Permitted	0.95	0.96	1.00		0.65	1.00	0.24	1.00		0.09	1.00	1.00	
Satd. Flow (perm)	1681	1691	1583		1203	1583	450	3537		163	3539	1583	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	937	34	91	27	38	80	113	992	5	45	687	564	
RTOR Reduction (vph)	0	0	55	0	0	73	0	0	0	0	0	380	
Lane Group Flow (vph)	487	484	36	0	65	7	113	997	0	45	687	184	
Turn Type	Split	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm	
Protected Phases	3	3			1			2			2		
Permitted Phases			3	1		1	2			2		2	
Actuated Green, G (s)	54.7	54.7	54.7		12.1	12.1	45.7	45.7		45.7	45.7	45.7	
Effective Green, g (s)	54.7	54.7	54.7		12.1	12.1	45.7	45.7		45.7	45.7	45.7	
Actuated g/C Ratio	0.39	0.39	0.39		0.09	0.09	0.33	0.33		0.33	0.33	0.33	
Clearance Time (s)	6.3	6.3	6.3		6.8	6.8	6.3	6.3		6.3	6.3	6.3	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	656	660	618		103	136	146	1154		53	1155	516	
v/s Ratio Prot	c0.29	0.29						c0.28			0.19		
v/s Ratio Perm			0.02		c0.05	0.00	0.25			0.28		0.12	
v/c Ratio	0.74	0.73	0.06		0.63	0.05	0.77	0.86		0.85	0.59	0.36	
Uniform Delay, d1	36.6	36.4	26.6		61.8	58.7	42.5	44.2		43.9	39.4	35.9	
Progression Factor	1.00	1.00	1.00		1.00	1.00	0.48	0.50		1.00	1.00	1.00	
Incremental Delay, d2	7.4	7.1	0.2		11.9	0.2	27.7	7.4		84.9	2.3	1.9	
Delay (s)	44.0	43.5	26.8		73.7	58.8	47.9	29.5		128.8	41.7	37.9	
Level of Service	D	D	C		E	E	D	C		F	D	D	
Approach Delay (s)		42.3			65.5			31.4			43.0		
Approach LOS		D			E			C			D		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			40.1		HCM 2000 Level of Service						D		
HCM 2000 Volume to Capacity ratio			0.74										
Actuated Cycle Length (s)			140.0		Sum of lost time (s)						22.4		
Intersection Capacity Utilization			85.0%		ICU Level of Service						E		
Analysis Period (min)			15										

c Critical Lane Group

Queues

129: Channelside Dr & Kennedy Blvd

01/19/2022



Lane Group	EBL	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	487	484	91	65	80	113	997	45	687	564
v/c Ratio	0.74	0.73	0.13	0.62	0.35	0.77	0.86	0.85	0.59	0.63
Control Delay	44.9	44.3	4.2	86.5	10.8	50.1	30.0	132.7	42.0	6.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.9	44.3	4.2	86.5	10.8	50.1	30.0	132.7	42.0	6.1
Queue Length 50th (ft)	397	392	0	58	0	93	450	38	275	0
Queue Length 95th (ft)	547	541	30	109	36	m#132	m540	#121	341	91
Internal Link Dist (ft)		906		876			591		1242	
Turn Bay Length (ft)			140			280		75		375
Base Capacity (vph)	656	661	680	130	259	147	1154	53	1155	896
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.73	0.13	0.50	0.31	0.77	0.86	0.85	0.59	0.63

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

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

# HCM Signalized Intersection Capacity Analysis

## 113: Florida Ave & Selmon Expy Off-Ramp

01/19/2022



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↑↑↑	↑↑			
Traffic Volume (vph)	0	749	1815	0	0	0
Future Volume (vph)	0	749	1815	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.6	6.0			
Lane Util. Factor		0.76	0.95			
Frt		0.85	1.00			
Flt Protected		1.00	1.00			
Satd. Flow (prot)		3610	3539			
Flt Permitted		1.00	1.00			
Satd. Flow (perm)		3610	3539			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	814	1973	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	814	1973	0	0	0
Turn Type		Prot	NA			
Protected Phases		2	1 4			
Permitted Phases						
Actuated Green, G (s)		32.4	95.0			
Effective Green, g (s)		32.4	95.0			
Actuated g/C Ratio		0.23	0.68			
Clearance Time (s)		6.6				
Vehicle Extension (s)		3.0				
Lane Grp Cap (vph)		835	2401			
v/s Ratio Prot		c0.23	c0.56			
v/s Ratio Perm						
v/c Ratio		0.97	0.82			
Uniform Delay, d1		53.4	16.3			
Progression Factor		1.00	0.37			
Incremental Delay, d2		25.6	0.2			
Delay (s)		79.0	6.2			
Level of Service		E	A			
Approach Delay (s)	79.0		6.2		0.0	
Approach LOS	E		A		A	

### Intersection Summary

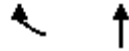
HCM 2000 Control Delay	27.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	128.2%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

# Queues

## 113: Florida Ave & Selmon Expy Off-Ramp

01/19/2022



Lane Group	WBR	NBT
Lane Group Flow (vph)	814	1973
v/c Ratio	0.97	0.82
Control Delay	78.7	6.5
Queue Delay	0.0	0.0
Total Delay	78.7	6.5
Queue Length 50th (ft)	325	481
Queue Length 95th (ft)	#438	m66
Internal Link Dist (ft)		1
Turn Bay Length (ft)	350	
Base Capacity (vph)	835	2401
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.97	0.82

### Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.
















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



# HCM Signalized Intersection Capacity Analysis

109: Florida Ave & Brorein St

01/19/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	2599	40	299	2325	0	0	0	0
Future Volume (vph)	0	0	0	0	2599	40	299	2325	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					5.8		6.1	6.1				
Lane Util. Factor					0.86		1.00	0.91				
Flt					1.00		1.00	1.00				
Flt Protected					1.00		0.95	1.00				
Satd. Flow (prot)					6393		1770	5085				
Flt Permitted					1.00		0.95	1.00				
Satd. Flow (perm)					6393		1770	5085				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	2825	43	325	2527	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	1	0	22	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	2867	0	303	2527	0	0	0	0
Turn Type					NA		Perm	NA				
Protected Phases					2			4				
Permitted Phases							4					
Actuated Green, G (s)					54.2		73.9	73.9				
Effective Green, g (s)					54.2		73.9	73.9				
Actuated g/C Ratio					0.37		0.51	0.51				
Clearance Time (s)					5.8		6.1	6.1				
Vehicle Extension (s)					3.0		3.0	3.0				
Lane Grp Cap (vph)					2389		902	2591				
v/s Ratio Prot					c0.45			c0.50				
v/s Ratio Perm							0.17					
v/c Ratio					1.20		0.34	0.98				
Uniform Delay, d1					45.4		21.0	34.7				
Progression Factor					1.00		1.00	1.00				
Incremental Delay, d2					94.3		1.0	12.8				
Delay (s)					139.7		22.0	47.4				
Level of Service					F		C	D				
Approach Delay (s)		0.0			139.7			44.5			0.0	
Approach LOS		A			F			D			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			92.3		HCM 2000 Level of Service			F				
HCM 2000 Volume to Capacity ratio			1.05									
Actuated Cycle Length (s)			145.0		Sum of lost time (s)			14.9				
Intersection Capacity Utilization			93.2%		ICU Level of Service			F				
Analysis Period (min)			15									
c Critical Lane Group												

# Queues

## 109: Florida Ave & Brorein St

01/19/2022



Lane Group	WBT	NBL	NBT
Lane Group Flow (vph)	2868	325	2527
v/c Ratio	1.20	0.35	0.98
Control Delay	133.9	19.4	47.4
Queue Delay	0.0	1.9	42.5
Total Delay	133.9	21.3	89.9
Queue Length 50th (ft)	~955	154	832
Queue Length 95th (ft)	#1018	225	#968
Internal Link Dist (ft)	416		356
Turn Bay Length (ft)		300	
Base Capacity (vph)	2391	923	2591
Starvation Cap Reductn	0	440	747
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	1.20	0.67	1.37

### Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis  
 110: Morgan St & Brorein St & Selmon Expy Off-Ramp

01/19/2022



Movement	WBL	WBT	NBL	NBT	NBR2	SBL	SBT	SBR	SWR	SWR2
Lane Configurations		↕↕	↗	↕	↗	↗	↗		↗	↗
Traffic Volume (vph)	4	1603	649	513	593	409	27	753	1099	230
Future Volume (vph)	4	1603	649	513	593	409	27	753	1099	230
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.7	5.5	6.0	6.0	5.5	6.0		5.7	5.7
Lane Util. Factor		0.95	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt		1.00	1.00	1.00	0.85	1.00	0.86		1.00	0.85
Flt Protected		1.00	0.95	1.00	1.00	0.95	1.00		1.00	1.00
Satd. Flow (prot)		3539	1770	1863	1583	1770	1593		1863	1583
Flt Permitted		1.00	0.06	1.00	1.00	0.32	1.00		1.00	1.00
Satd. Flow (perm)		3539	107	1863	1583	590	1593		1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	1742	705	558	645	445	29	818	1195	250
RTOR Reduction (vph)	0	0	0	0	42	0	0	0	0	73
Lane Group Flow (vph)	0	1746	705	558	604	445	847	0	1195	177
Turn Type	Perm	NA	pm+pt	NA	Perm	pm+pt	NA		Prot	Perm
Protected Phases		2!	7	4		3	8		2!	
Permitted Phases	2		4		4	8				2
Actuated Green, G (s)		46.3	82.0	70.0	70.0	70.5	64.0		46.3	46.3
Effective Green, g (s)		46.3	82.0	70.0	70.0	70.5	64.0		46.3	46.3
Actuated g/C Ratio		0.33	0.59	0.50	0.50	0.50	0.46		0.33	0.33
Clearance Time (s)		5.7	5.5	6.0	6.0	5.5	6.0		5.7	5.7
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		1170	211	931	791	351	728		616	523
v/s Ratio Prot			c0.30	0.30		0.06	0.53		c0.64	
v/s Ratio Perm		0.49	c1.65		0.38	0.58				0.11
v/c Ratio		1.49	3.34	0.60	0.76	1.27	1.16		1.94	0.34
Uniform Delay, d1		46.9	47.0	25.0	28.3	37.1	38.0		46.9	35.3
Progression Factor		0.66	0.98	1.00	1.03	0.94	0.96		1.00	1.00
Incremental Delay, d2		222.0	1060.6	1.7	4.1	133.8	83.0		428.9	1.8
Delay (s)		253.0	1106.5	26.7	33.3	168.8	119.5		475.8	37.1
Level of Service		F	F	C	C	F	F		F	D
Approach Delay (s)		253.0		427.9			136.5			
Approach LOS		F		F			F			

Intersection Summary

HCM 2000 Control Delay	314.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	2.88		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	17.2
Intersection Capacity Utilization	215.5%	ICU Level of Service	H
Analysis Period (min)	15		

! Phase conflict between lane groups.

c Critical Lane Group

Queues

110: Morgan St & Brorein St & Selmon Expy Off-Ramp

01/19/2022



Lane Group	WBT	NBL	NBT	NBR2	SBL	SBT	SWR	SWR2
Lane Group Flow (vph)	1746	705	558	645	445	847	1195	250
v/c Ratio	1.49	3.33	0.60	0.77	1.26	1.16	1.94	0.42
Control Delay	249.2	1069.5	27.2	30.3	155.0	117.2	456.3	22.3
Queue Delay	0.5	0.0	20.0	45.0	0.0	1.1	0.0	0.0
Total Delay	249.7	1069.5	47.2	75.3	155.0	118.2	456.3	22.3
Queue Length 50th (ft)	~1180	~1088	422	486	~314	~920	~1676	97
Queue Length 95th (ft)	m#750	m#1214	m469	m560	m#428	m#1033	#1941	177
Internal Link Dist (ft)	494		424			563		
Turn Bay Length (ft)		250		10			300	300
Base Capacity (vph)	1170	212	931	833	354	728	616	596
Starvation Cap Reductn	124	0	373	238	0	111	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.67	3.33	1.00	1.08	1.26	1.37	1.94	0.42






















Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

# HCM 6th Signalized Intersection Summary

111: Jefferson St & Brorein St

01/19/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	545	482	28	3	1098	811	210	158	545	139	225	299
Future Volume (veh/h)	545	482	28	3	1098	811	210	158	545	139	225	299
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	592	524	30	3	1193	882	228	172	592	151	245	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	325	955	55	351	724	475	324	473	422	172	525	
Arrive On Green	0.15	0.55	0.55	0.70	0.70	0.70	0.05	0.27	0.27	0.02	0.09	0.00
Sat Flow, veh/h	1781	1752	100	854	2055	1349	1781	1777	1585	1781	1870	1585
Grp Volume(v), veh/h	592	0	554	3	1011	1064	228	172	592	151	245	0
Grp Sat Flow(s),veh/h/ln	1781	0	1852	854	1777	1628	1781	1777	1585	1781	1870	1585
Q Serve(g_s), s	21.5	0.0	27.2	0.1	49.3	49.3	7.5	11.0	37.3	8.5	17.4	0.0
Cycle Q Clear(g_c), s	21.5	0.0	27.2	0.3	49.3	49.3	7.5	11.0	37.3	8.5	17.4	0.0
Prop In Lane	1.00		0.05	1.00		0.83	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	325	0	1010	351	626	573	324	473	422	172	525	
V/C Ratio(X)	1.82	0.00	0.55	0.01	1.62	1.86	0.70	0.36	1.40	0.88	0.47	
Avail Cap(c_a), veh/h	325	0	1010	351	626	573	324	473	422	172	525	
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	0.16	0.00	0.16	0.75	0.75	0.75	0.96	0.96	0.96	1.00	1.00	0.00
Uniform Delay (d), s/veh	46.9	0.0	20.7	13.5	20.7	20.7	45.0	41.7	51.4	40.7	53.6	0.0
Incr Delay (d2), s/veh	371.7	0.0	0.3	0.0	282.6	390.5	11.6	2.1	194.1	42.1	3.0	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	45.0	0.0	11.8	0.0	61.2	73.3	4.9	5.2	37.5	6.0	9.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	418.6	0.0	21.0	13.5	303.3	411.2	56.6	43.8	245.5	82.9	56.5	0.0
LnGrp LOS	F	A	C	B	F	F	E	D	F	F	E	
Approach Vol, veh/h		1146			2078			992			396	A
Approach Delay, s/veh		226.4			358.1			167.1			66.6	
Approach LOS		F			F			F			E	
Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	27.0	55.0	15.0	43.0		82.0	13.0	45.0				
Change Period (Y+Rc), s	5.5	* 5.7	5.5	* 5.7		* 5.7	5.5	* 5.7				
Max Green Setting (Gmax), s	21.5	* 49	9.5	* 37		* 76	7.5	* 39				
Max Q Clear Time (g_c+I1), s	23.5	51.3	10.5	39.3		29.2	9.5	19.4				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0		4.3	0.0	1.3				

## Intersection Summary

HCM 6th Ctrl Delay 259.3

HCM 6th LOS F

## Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Queues

111: Jefferson St & Brorein St

01/19/2022



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	592	554	3	2075	228	764	151	245	325
v/c Ratio	1.82	0.55	0.01	1.65	0.69	0.92dr	0.82	0.47	0.48
Control Delay	401.5	5.9	21.3	315.9	45.9	30.1	45.8	43.0	6.2
Queue Delay	0.0	1.9	0.0	4.1	3.3	37.5	79.5	0.0	0.4
Total Delay	401.5	7.9	21.3	320.1	49.2	67.6	125.3	43.0	6.5
Queue Length 50th (ft)	~750	138	1	~1412	142	201	100	205	58
Queue Length 95th (ft)	m#809	m122	m2	m#1260	213	280	m102	m222	m45
Internal Link Dist (ft)		494		148		443		116	
Turn Bay Length (ft)	150		50		100		50		
Base Capacity (vph)	325	1008	299	1261	331	1052	185	522	678
Starvation Cap Reductn	0	296	0	4	0	0	0	0	0
Spillback Cap Reductn	0	232	0	668	44	335	121	0	85
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.82	0.78	0.01	3.50	0.79	1.07	2.36	0.47	0.55

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.
- dr Defacto Right Lane. Recode with 1 though lane as a right lane.

HCM 6th Signalized Intersection Summary  
 112: Nebraska Ave & Brorein St

01/19/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↕			↕			↕	
Traffic Volume (veh/h)	178	722	266	26	1265	68	202	12	451	5	41	444
Future Volume (veh/h)	178	722	266	26	1265	68	202	12	451	5	41	444
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	193	785	289	28	1375	74	220	13	490	5	45	483
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	296	869	320	402	2286	123	74	2	90	27	38	385
Arrive On Green	1.00	1.00	1.00	1.00	1.00	1.00	0.25	0.25	0.25	0.25	0.25	0.25
Sat Flow, veh/h	367	1304	480	525	3430	184	160	9	356	6	153	1527
Grp Volume(v), veh/h	193	0	1074	28	711	738	723	0	0	533	0	0
Grp Sat Flow(s),veh/h/ln	367	0	1784	525	1777	1837	526	0	0	1685	0	0
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	35.3	0.0	0.0	35.3	0.0	0.0
Prop In Lane	1.00		0.27	1.00		0.10	0.30		0.68	0.01		0.91
Lane Grp Cap(c), veh/h	296	0	1189	402	1184	1224	166	0	0	451	0	0
V/C Ratio(X)	0.65	0.00	0.90	0.07	0.60	0.60	4.35	0.00	0.00	1.18	0.00	0.00
Avail Cap(c_a), veh/h	296	0	1189	402	1184	1224	166	0	0	451	0	0
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.76	0.00	0.76	0.09	0.09	0.09	0.43	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	55.9	0.0	0.0	53.9	0.0	0.0
Incr Delay (d2), s/veh	8.2	0.0	8.9	0.0	0.2	0.2	1515.5	0.0	0.0	102.6	0.0	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	2.9	0.0	0.1	0.1	75.9	0.0	0.0	29.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	8.2	0.0	8.9	0.0	0.2	0.2	1571.4	0.0	0.0	156.5	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	F	A	A	F	A	A
Approach Vol, veh/h		1267			1477			723				533
Approach Delay, s/veh		8.8			0.2			1571.4				156.5
Approach LOS		A			A			F				F
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		99.0		41.0		99.0		41.0				
Change Period (Y+Rc), s		* 5.7		* 5.7		* 5.7		* 5.7				
Max Green Setting (Gmax), s		* 93		* 35		* 93		* 35				
Max Q Clear Time (g_c+I1), s		2.0		37.3		2.0		37.3				
Green Ext Time (p_c), s		17.8		0.0		25.4		0.0				

Intersection Summary

HCM 6th Ctrl Delay	307.7
HCM 6th LOS	F

Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

# Queues

## 112: Nebraska Ave & Brorein St

01/19/2022



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	193	1074	28	1449	723	533
v/c Ratio	1.23	0.90	0.25	0.62	4.41	1.16
Control Delay	169.2	38.3	14.0	16.8	1557.2	133.4
Queue Delay	1.3	25.5	0.0	1.5	21.7	17.5
Total Delay	170.6	63.8	14.0	18.4	1578.9	150.8
Queue Length 50th (ft)	~186	900	12	480	~1075	~524
Queue Length 95th (ft)	m#262	#1161	m23	m421	#1326	#754
Internal Link Dist (ft)		148		203	457	414
Turn Bay Length (ft)	50		70			
Base Capacity (vph)	157	1200	111	2342	164	460
Starvation Cap Reductn	11	173	0	588	0	0
Spillback Cap Reductn	0	160	0	654	99	329
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.32	1.05	0.25	0.86	11.12	4.07

### Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

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



# HCM 6th Signalized Intersection Summary

701: Water St

01/19/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↕		↖	↗		↖	↗	
Traffic Volume (veh/h)	27	1068	78	32	734	13	462	145	49	12	66	163
Future Volume (veh/h)	27	1068	78	32	734	13	462	145	49	12	66	163
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	29	1161	85	35	798	14	502	158	53	13	72	177
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	516	1192	87	360	2473	43	168	368	124	141	90	221
Arrive On Green	1.00	1.00	1.00	1.00	1.00	1.00	0.02	0.09	0.09	0.19	0.19	0.19
Sat Flow, veh/h	672	1722	126	446	3573	63	1781	1340	449	1171	479	1179
Grp Volume(v), veh/h	29	0	1246	35	397	415	502	0	211	13	0	249
Grp Sat Flow(s),veh/h/ln	672	0	1848	446	1777	1859	1781	0	1789	1171	0	1658
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	6.5	0.0	15.6	1.5	0.0	20.1
Cycle Q Clear(g_c), s	0.2	0.0	0.0	0.3	0.0	0.0	6.5	0.0	15.6	17.1	0.0	20.1
Prop In Lane	1.00		0.07	1.00		0.03	1.00		0.25	1.00		0.71
Lane Grp Cap(c), veh/h	516	0	1279	360	1230	1287	168	0	492	141	0	312
V/C Ratio(X)	0.06	0.00	0.97	0.10	0.32	0.32	2.99	0.00	0.43	0.09	0.00	0.80
Avail Cap(c_a), veh/h	516	0	1279	360	1230	1287	168	0	492	141	0	312
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	0.32	0.00	0.32	0.82	0.82	0.82	0.88	0.00	0.88	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	66.9	0.0	53.2	60.4	0.0	54.3
Incr Delay (d2), s/veh	0.1	0.0	9.4	0.4	0.6	0.5	907.5	0.0	2.4	1.3	0.0	19.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	3.3	0.0	0.2	0.2	48.6	0.0	7.9	0.5	0.0	10.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.1	0.0	9.4	0.4	0.6	0.5	974.4	0.0	55.6	61.7	0.0	73.3
LnGrp LOS	A	A	A	A	A	A	F	A	E	E	A	E
Approach Vol, veh/h		1275			847			713				262
Approach Delay, s/veh		9.2			0.6			702.5				72.8
Approach LOS		A			A			F				E
Timer - Assigned Phs		2		4		6	7	8				
Phs Duration (G+Y+Rc), s		102.8		44.2		102.8	12.2	32.0				
Change Period (Y+Rc), s		* 5.7		* 5.7		* 5.7	* 5.7	* 5.7				
Max Green Setting (Gmax), s		* 90		* 38		* 90	* 6.5	* 26				
Max Q Clear Time (g_c+I1), s		2.3		17.6		2.2	8.5	22.1				
Green Ext Time (p_c), s		7.0		1.2		23.0	0.0	0.6				

## Intersection Summary

HCM 6th Ctrl Delay	171.8
HCM 6th LOS	F

## Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Queues  
701: Water St

01/19/2022



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	29	1246	35	812	502	211	13	249
v/c Ratio	0.08	1.05	0.67	0.36	2.11	0.42	0.08	0.66
Control Delay	8.0	46.3	65.6	8.9	540.7	43.7	48.8	45.3
Queue Delay	0.0	22.5	0.0	0.2	12.8	0.0	0.0	2.0
Total Delay	8.0	68.8	65.6	9.1	553.5	43.7	48.8	47.3
Queue Length 50th (ft)	8	~1229	11	104	~733	161	10	147
Queue Length 95th (ft)	m7	m549	m#66	132	#880	239	31	246
Internal Link Dist (ft)		203		452		462		361
Turn Bay Length (ft)	70		70		150		150	
Base Capacity (vph)	370	1191	52	2276	238	498	154	375
Starvation Cap Reductn	0	280	0	663	0	0	0	0
Spillback Cap Reductn	0	0	0	176	123	0	0	45
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	1.37	0.67	0.50	4.37	0.42	0.08	0.75

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

HCM 6th Signalized Intersection Summary  
 120: Meridian Ave & Cumberland Ave

01/19/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗			↖	↗	↖	↗		↖	↗	↖
Traffic Volume (veh/h)	932	120	77	1	478	140	172	1112	121	267	531	140
Future Volume (veh/h)	932	120	77	1	478	140	172	1112	121	267	531	140
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	1013	130	84	1	520	0	187	1209	132	290	577	152
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	334	499	322	26	879		329	1145	125	123	1259	562
Arrive On Green	0.78	0.78	0.78	0.47	0.47	0.00	0.01	0.12	0.12	0.08	0.71	0.71
Sat Flow, veh/h	882	1061	686	0	1870	1585	1781	3232	352	1781	3554	1585
Grp Volume(v), veh/h	1013	0	214	521	0	0	187	663	678	290	577	152
Grp Sat Flow(s),veh/h/ln	882	0	1747	1870	0	1585	1781	1777	1807	1781	1777	1585
Q Serve(g_s), s	37.2	0.0	4.6	0.0	0.0	0.0	5.6	49.6	49.6	5.6	9.8	4.8
Cycle Q Clear(g_c), s	65.8	0.0	4.6	28.6	0.0	0.0	5.6	49.6	49.6	5.6	9.8	4.8
Prop In Lane	1.00		0.39	0.00		1.00	1.00		0.19	1.00		1.00
Lane Grp Cap(c), veh/h	334	0	821	905	0		329	630	640	123	1259	562
V/C Ratio(X)	3.03	0.00	0.26	0.58	0.00		0.57	1.05	1.06	2.36	0.46	0.27
Avail Cap(c_a), veh/h	334	0	821	905	0		329	630	640	123	1259	562
HCM Platoon Ratio	1.67	1.67	1.67	1.00	1.00	1.00	0.33	0.33	0.33	2.00	2.00	2.00
Upstream Filter(I)	0.09	0.00	0.09	1.00	0.00	0.00	0.09	0.09	0.09	0.95	0.95	0.95
Uniform Delay (d), s/veh	27.5	0.0	8.5	27.3	0.0	0.0	34.3	61.8	61.8	38.8	14.6	13.9
Incr Delay (d2), s/veh	916.3	0.0	0.1	2.7	0.0	0.0	0.6	28.4	30.4	637.0	1.1	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	96.3	0.0	1.6	13.6	0.0	0.0	2.4	28.6	29.5	24.2	3.3	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	943.8	0.0	8.5	29.9	0.0	0.0	35.0	90.2	92.2	675.8	15.7	15.0
LnGrp LOS	F	A	A	C	A		C	F	F	F	B	B
Approach Vol, veh/h		1227			521	A		1528			1019	
Approach Delay, s/veh		780.7			29.9			84.3			203.5	
Approach LOS		F			C			F			F	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	12.0	56.0		72.0	12.0	56.0		72.0				
Change Period (Y+Rc), s	6.4	6.4		* 6.2	6.4	6.4		* 6.2				
Max Green Setting (Gmax), s	5.6	49.6		* 66	5.6	49.6		* 66				
Max Q Clear Time (g_c+I1), s	7.6	11.8		67.8	7.6	51.6		30.6				
Green Ext Time (p_c), s	0.0	4.6		0.0	0.0	0.0		4.0				

Intersection Summary

HCM 6th Ctrl Delay	304.9
HCM 6th LOS	F

Notes

\* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.  
 Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Queues

120: Meridian Ave & Cumberland Ave

01/19/2022



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	1013	214	521	152	187	1341	290	577	152
v/c Ratio	3.88	0.25	0.60	0.19	0.65	1.08	2.34	0.46	0.23
Control Delay	1310.5	14.4	30.8	11.3	27.5	78.3	649.4	34.1	10.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	8.6	0.0	0.0	0.0
Total Delay	1310.5	14.4	30.8	11.3	27.5	86.9	649.4	34.1	10.6
Queue Length 50th (ft)	~1438	52	343	38	93	~621	~389	149	2
Queue Length 95th (ft)	m#1371	m50	462	82	m85	m363	#584	298	71
Internal Link Dist (ft)		452	888			460		712	
Turn Bay Length (ft)	100			100	200		250		
Base Capacity (vph)	261	840	875	784	288	1240	124	1253	658
Starvation Cap Reductn	0	0	0	0	0	235	0	0	0
Spillback Cap Reductn	0	0	0	2	0	114	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	3.88	0.25	0.60	0.19	0.65	1.33	2.34	0.46	0.23

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

# HCM Signalized Intersection Capacity Analysis

## 102: Florida Ave & Whiting St

01/19/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔			↔↔			↔↔↔	↔			
Traffic Volume (vph)	262	532	0	0	446	316	149	2645	103	0	0	0
Future Volume (vph)	262	532	0	0	446	316	149	2645	103	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			5.7	5.7			
Lane Util. Factor		0.95			0.95			0.91	1.00			
Frt		1.00			0.94			1.00	0.85			
Flt Protected		0.98			1.00			1.00	1.00			
Satd. Flow (prot)		3482			3319			5072	1583			
Flt Permitted		0.51			1.00			1.00	1.00			
Satd. Flow (perm)		1804			3319			5072	1583			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	285	578	0	0	485	343	162	2875	112	0	0	0
RTOR Reduction (vph)	0	0	0	0	28	0	0	0	18	0	0	0
Lane Group Flow (vph)	0	863	0	0	800	0	0	3037	94	0	0	0
Turn Type	Perm	NA			NA		Perm	NA	Perm			
Protected Phases		4			4			2				
Permitted Phases	4						2		2			
Actuated Green, G (s)		49.0			49.0			74.3	74.3			
Effective Green, g (s)		49.0			49.0			74.3	74.3			
Actuated g/C Ratio		0.35			0.35			0.53	0.53			
Clearance Time (s)		6.0			6.0			5.7	5.7			
Vehicle Extension (s)		3.0			3.0			3.0	3.0			
Lane Grp Cap (vph)		631			1161			2691	840			
v/s Ratio Prot					0.24							
v/s Ratio Perm		c0.48						0.60	0.06			
v/c Ratio		2.44dl			0.69			1.13	0.11			
Uniform Delay, d1		45.5			39.0			32.9	16.4			
Progression Factor		1.00			0.80			1.00	1.00			
Incremental Delay, d2		175.5			1.2			63.2	0.3			
Delay (s)		221.0			32.5			96.1	16.7			
Level of Service		F			C			F	B			
Approach Delay (s)		221.0			32.5			93.3			0.0	
Approach LOS		F			C			F			A	

### Intersection Summary

HCM 2000 Control Delay	105.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.19		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	13.7
Intersection Capacity Utilization	113.7%	ICU Level of Service	H
Analysis Period (min)	15		

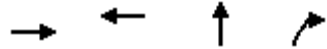
dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group

# Queues

## 102: Florida Ave & Whiting St

01/19/2022



Lane Group	EBT	WBT	NBT	NBR
Lane Group Flow (vph)	863	828	3037	112
v/c Ratio	2.44dl	0.70	1.13	0.13
Control Delay	211.6	31.1	95.2	11.1
Queue Delay	0.0	0.4	0.3	0.0
Total Delay	211.6	31.5	95.6	11.1
Queue Length 50th (ft)	~544	243	~1171	32
Queue Length 95th (ft)	#677	m294	#1246	64
Internal Link Dist (ft)	821	519	567	
Turn Bay Length (ft)				100
Base Capacity (vph)	631	1189	2690	858
Starvation Cap Reductn	0	82	374	0
Spillback Cap Reductn	4	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.38	0.75	1.31	0.13

### Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.
- dl Defacto Left Lane. Recode with 1 though lane as a left lane.

# HCM Signalized Intersection Capacity Analysis

## 103: Morgan St & Whiting St

01/19/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	139	493	154	183	519	184	183	598	96	77	581	75
Future Volume (vph)	139	493	154	183	519	184	183	598	96	77	581	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.8	5.8		5.8	5.8			5.7			5.7	
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	
Frt	1.00	0.96		1.00	0.96			0.98			0.98	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.99	
Satd. Flow (prot)	1770	1796		1770	1790			3445			3466	
Flt Permitted	0.08	1.00		0.13	1.00			0.58			0.61	
Satd. Flow (perm)	154	1796		247	1790			2004			2124	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	151	536	167	199	564	200	199	650	104	84	632	82
RTOR Reduction (vph)	0	8	0	0	9	0	0	6	0	0	6	0
Lane Group Flow (vph)	151	695	0	199	755	0	0	947	0	0	792	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2			2		
Actuated Green, G (s)	64.2	64.2		64.2	64.2			64.3			64.3	
Effective Green, g (s)	64.2	64.2		64.2	64.2			64.3			64.3	
Actuated g/C Ratio	0.46	0.46		0.46	0.46			0.46			0.46	
Clearance Time (s)	5.8	5.8		5.8	5.8			5.7			5.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	70	823		113	820			920			975	
v/s Ratio Prot		0.39			0.42							
v/s Ratio Perm	c0.98			0.80				c0.47			0.37	
v/c Ratio	2.16	0.84		1.76	0.92			1.03			0.81	
Uniform Delay, d1	37.9	33.5		37.9	35.5			37.9			32.6	
Progression Factor	0.46	0.47		0.95	0.95			0.90			1.00	
Incremental Delay, d2	536.5	3.8		367.8	13.6			35.8			7.3	
Delay (s)	553.9	19.7		403.8	47.2			69.7			40.0	
Level of Service	F	B		F	D			E			D	
Approach Delay (s)		114.2			120.9			69.7			40.0	
Approach LOS		F			F			E			D	

### Intersection Summary

HCM 2000 Control Delay	87.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.58		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	11.5
Intersection Capacity Utilization	111.6%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Queues

103: Morgan St & Whiting St

01/19/2022



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	151	703	199	764	953	798
v/c Ratio	2.13	0.85	1.76	0.92	1.03	0.81
Control Delay	541.6	20.2	394.0	47.0	68.9	40.1
Queue Delay	0.0	10.0	0.0	46.1	26.3	50.0
Total Delay	541.6	30.1	394.0	93.1	95.2	90.1
Queue Length 50th (ft)	~216	201	~269	602	~295	320
Queue Length 95th (ft)	m#213	m178	m#318	m#808	#611	416
Internal Link Dist (ft)		519		503	563	436
Turn Bay Length (ft)			150			
Base Capacity (vph)	71	831	113	830	927	983
Starvation Cap Reductn	0	110	0	154	0	0
Spillback Cap Reductn	0	2	0	0	59	280
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	2.13	0.98	1.76	1.13	1.10	1.14

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.



# HCM Signalized Intersection Capacity Analysis

## 104: Jefferson St & Whiting St

01/19/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕			↕↕			↕↕	
Traffic Volume (vph)	91	466	417	76	395	383	153	491	19	76	568	97
Future Volume (vph)	91	466	417	76	395	383	153	491	19	76	568	97
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.1			6.1			6.1			6.0	
Lane Util. Factor		0.95			0.95			0.95			0.95	
Frt		0.94			0.93			1.00			0.98	
Flt Protected		1.00			1.00			0.99			0.99	
Satd. Flow (prot)		3297			3287			3484			3452	
Flt Permitted		0.60			0.58			0.56			0.68	
Satd. Flow (perm)		1978			1917			1970			2358	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	99	507	453	83	429	416	166	534	21	83	617	105
RTOR Reduction (vph)	0	96	0	0	92	0	0	2	0	0	7	0
Lane Group Flow (vph)	0	963		0	836		0	719		0	798	
Turn Type	pm+pt	NA		Perm		NA		pm+pt		Perm		NA
Protected Phases	3	8				4		1		6		2
Permitted Phases	8			4				6		2		
Actuated Green, G (s)		62.9			62.9			59.9			60.0	
Effective Green, g (s)		62.9			62.9			59.9			60.0	
Actuated g/C Ratio		0.45			0.45			0.43			0.43	
Clearance Time (s)		6.1			6.1			6.1			6.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		888			861			842			1010	
v/s Ratio Prot												
v/s Ratio Perm		c0.49			0.44			c0.37			0.34	
v/c Ratio		1.08			0.97			0.85			0.79	
Uniform Delay, d1		38.5			37.7			36.1			34.5	
Progression Factor		1.22			0.82			0.50			1.00	
Incremental Delay, d2		52.9			22.9			0.8			6.3	
Delay (s)		100.1			53.6			19.0			40.8	
Level of Service		F			D			B			D	
Approach Delay (s)		100.1			53.6			19.0			40.8	
Approach LOS		F			D			B			D	

### Intersection Summary

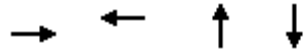
HCM 2000 Control Delay	57.6	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	25.9
Intersection Capacity Utilization	114.2%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

# Queues

## 104: Jefferson St & Whiting St

01/19/2022



Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	1059	928	721	805
v/c Ratio	1.08	0.97	0.85	0.79
Control Delay	85.6	48.4	19.9	41.0
Queue Delay	0.0	10.8	9.7	3.2
Total Delay	85.6	59.1	29.7	44.2
Queue Length 50th (ft)	~521	216	270	325
Queue Length 95th (ft)	m#644	#324	m117	415
Internal Link Dist (ft)	503	427	450	207
Turn Bay Length (ft)				
Base Capacity (vph)	985	954	845	1016
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	44	106	127
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.08	1.02	0.98	0.91

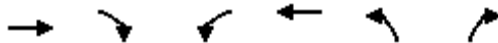
### Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

# HCM Signalized Intersection Capacity Analysis

## 715: Selmon Expy Off-Ramp & Whiting St

01/19/2022



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↘	↗↗
Traffic Volume (vph)	563	0	0	648	239	911
Future Volume (vph)	563	0	0	648	239	911
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.7			5.7	6.0	6.0
Lane Util. Factor	0.95			0.95	1.00	0.88
Fr <sub>t</sub>	1.00			1.00	1.00	0.85
Fl <sub>t</sub> Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3539			3539	1770	2787
Fl <sub>t</sub> Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3539			3539	1770	2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	612	0	0	704	260	990
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	612	0	0	704	260	990
Turn Type	NA			NA	Prot	custom
Protected Phases	5			2	4	4 6
Permitted Phases						
Actuated Green, G (s)	32.1			84.3	44.0	96.2
Effective Green, g (s)	32.1			84.3	44.0	90.5
Actuated g/C Ratio	0.23			0.60	0.31	0.65
Clearance Time (s)	5.7			5.7	6.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	811			2130	556	1801
v/s Ratio Prot	c0.17			0.20	0.15	c0.36
v/s Ratio Perm						
v/c Ratio	0.75			0.33	0.47	0.55
Uniform Delay, d <sub>1</sub>	50.3			13.8	38.6	13.6
Progression Factor	0.85			0.90	1.00	1.00
Incremental Delay, d <sub>2</sub>	0.4			0.2	2.8	1.2
Delay (s)	43.2			12.7	41.4	14.8
Level of Service	D			B	D	B
Approach Delay (s)	43.2			12.7	20.3	
Approach LOS	D			B	C	

### Intersection Summary

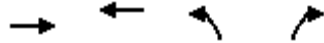
HCM 2000 Control Delay	23.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	17.4
Intersection Capacity Utilization	57.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

# Queues

## 715: Selmon Expy Off-Ramp & Whiting St

01/19/2022



Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	612	704	260	990
v/c Ratio	0.75	0.33	0.47	0.52
Control Delay	43.0	12.8	42.0	12.5
Queue Delay	0.2	1.1	0.0	0.0
Total Delay	43.2	13.9	42.0	12.5
Queue Length 50th (ft)	238	211	191	230
Queue Length 95th (ft)	m193	m213	279	339
Internal Link Dist (ft)	427	276	783	
Turn Bay Length (ft)			350	350
Base Capacity (vph)	1625	2130	556	1915
Starvation Cap Reductn	0	1119	0	0
Spillback Cap Reductn	373	0	0	14
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.49	0.70	0.47	0.52

### Intersection Summary

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

HCM 6th Signalized Intersection Summary  
 11: Water St/Brush St & Whiting St

01/19/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗		↖	↗			↕	
Traffic Volume (veh/h)	311	1023	140	246	319	176	230	205	64	222	124	99
Future Volume (veh/h)	311	1023	140	246	319	176	230	205	64	222	124	99
Initial Q (Qb), veh	0	0	0	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	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	338	1112	152	267	347	191	250	223	70	241	135	108
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	617	1913	913	379	1144	618	295	344	108	109	40	32
Arrive On Green	0.15	0.72	0.72	0.09	0.51	0.51	0.04	0.25	0.25	0.17	0.17	0.17
Sat Flow, veh/h	1781	3554	1585	1781	2227	1203	1781	1365	428	407	228	182
Grp Volume(v), veh/h	338	1112	152	267	276	262	250	0	293	484	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1654	1781	0	1793	817	0	0
Q Serve(g_s), s	12.7	21.3	4.0	9.8	12.5	12.9	5.3	0.0	20.4	14.9	0.0	0.0
Cycle Q Clear(g_c), s	12.7	21.3	4.0	9.8	12.5	12.9	5.3	0.0	20.4	24.3	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.73	1.00		0.24	0.50		0.22
Lane Grp Cap(c), veh/h	617	1913	913	379	912	849	295	0	452	180	0	0
V/C Ratio(X)	0.55	0.58	0.17	0.70	0.30	0.31	0.85	0.00	0.65	2.68	0.00	0.00
Avail Cap(c_a), veh/h	853	1913	913	520	912	849	295	0	452	180	0	0
HCM Platoon Ratio	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.76	0.76	0.76	0.88	0.88	0.88	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	12.6	12.2	8.3	15.9	19.6	19.7	52.9	0.0	46.8	64.2	0.0	0.0
Incr Delay (d2), s/veh	0.6	1.0	0.3	2.3	0.7	0.8	20.0	0.0	3.2	773.7	0.0	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.7	7.1	1.4	4.2	5.4	5.2	7.9	0.0	9.7	45.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.2	13.2	8.6	18.3	20.4	20.5	72.9	0.0	50.0	837.9	0.0	0.0
LnGrp LOS	B	B	A	B	C	C	E	A	D	F	A	A
Approach Vol, veh/h		1602			805			543			484	
Approach Delay, s/veh		12.7			19.7			60.6			837.9	
Approach LOS		B			B			E			F	
Timer - Assigned Phs	1	2		4	5	6	7	8				
Phs Duration (G+Y+Rc), s	21.4	77.6		41.0	17.9	81.1	11.0	30.0				
Change Period (Y+Rc), s	* 5.7	* 5.7		* 5.7	5.5	* 5.7	* 5.7	* 5.7				
Max Green Setting (Gmax), s	* 34	* 53		* 35	23.5	* 64	* 5.3	* 24				
Max Q Clear Time (g_c+I1), s	14.7	14.9		22.4	11.8	23.3	7.3	26.3				
Green Ext Time (p_c), s	1.0	3.8		1.5	0.6	11.5	0.0	0.0				

Intersection Summary

HCM 6th Ctrl Delay	138.2
HCM 6th LOS	F

Notes

- User approved pedestrian interval to be less than phase max green.
- \* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Queues

11: Water St/Brush St & Whiting St

01/19/2022



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	338	1112	152	267	538	250	293	484
v/c Ratio	0.57	0.61	0.15	0.77	0.31	0.94	0.64	2.51
Control Delay	9.5	20.2	2.1	29.8	28.6	92.1	52.0	716.8
Queue Delay	0.0	2.3	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.5	22.5	2.1	29.8	28.6	92.1	52.0	716.8
Queue Length 50th (ft)	64	327	15	151	170	200	230	~733
Queue Length 95th (ft)	83	401	40	214	227	#382	334	#957
Internal Link Dist (ft)		276			426		126	215
Turn Bay Length (ft)	100		200	300		50		
Base Capacity (vph)	745	1833	1005	448	1740	265	461	193
Starvation Cap Reductn	16	558	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.87	0.15	0.60	0.31	0.94	0.64	2.51

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

# HCM Signalized Intersection Capacity Analysis

## 7: Meridian Ave & Whiting St

01/19/2022



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	796	513	243	2006	553	498
Future Volume (vph)	796	513	243	2006	553	498
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	6.9	6.4	6.6	4.0
Lane Util. Factor	0.97	1.00	1.00	0.91	0.86	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3433	1583	1770	5085	6408	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3433	1583	1770	5085	6408	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	865	558	264	2180	601	541
RTOR Reduction (vph)	0	353	0	0	0	0
Lane Group Flow (vph)	865	205	264	2180	601	541
Turn Type	Prot	Perm	Prot	NA	NA	Free
Protected Phases	7 8		1	6	2	
Permitted Phases		7 8				Free
Actuated Green, G (s)	50.5	50.5	28.4	75.4	39.9	140.0
Effective Green, g (s)	50.5	50.5	28.4	75.4	39.9	140.0
Actuated g/C Ratio	0.36	0.36	0.20	0.54	0.28	1.00
Clearance Time (s)			6.9	6.4	6.6	
Vehicle Extension (s)			3.0	3.0	3.0	
Lane Grp Cap (vph)	1238	571	359	2738	1826	1583
v/s Ratio Prot	c0.25		0.15	c0.43	0.09	
v/s Ratio Perm		0.13				0.34
v/c Ratio	0.70	0.36	0.74	0.80	0.33	0.34
Uniform Delay, d1	38.2	32.9	52.3	26.1	39.5	0.0
Progression Factor	0.53	0.51	1.13	0.22	1.00	1.00
Incremental Delay, d2	0.6	0.1	4.0	1.3	0.5	0.6
Delay (s)	21.1	16.8	62.9	7.1	40.0	0.6
Level of Service	C	B	E	A	D	A
Approach Delay (s)	19.4			13.1	21.3	
Approach LOS	B			B	C	

### Intersection Summary

HCM 2000 Control Delay	16.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.7
Intersection Capacity Utilization	71.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

# Queues

## 7: Meridian Ave & Whiting St

01/19/2022



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	865	558	264	2180	601	541
v/c Ratio	0.67	0.59	0.74	0.80	0.33	0.34
Control Delay	20.2	2.1	65.4	7.9	42.2	0.6
Queue Delay	0.2	0.8	14.9	0.9	0.0	0.0
Total Delay	20.4	2.9	80.3	8.8	42.2	0.6
Queue Length 50th (ft)	303	9	176	88	128	0
Queue Length 95th (ft)	m104	m20	m226	119	174	0
Internal Link Dist (ft)	426			229	186	
Turn Bay Length (ft)	200	250	150			
Base Capacity (vph)	1581	1026	382	2739	1825	1583
Starvation Cap Reductn	180	206	101	280	0	0
Spillback Cap Reductn	0	15	0	0	10	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.68	0.94	0.89	0.33	0.34

### Intersection Summary

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



# HCM Signalized Intersection Capacity Analysis

## 107: Meridian Ave & Whiting St

01/19/2022



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T		T	T
Traffic Volume (vph)	66	172	2077	106	195	872
Future Volume (vph)	66	172	2077	106	195	872
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.7		6.4		5.5	6.9
Lane Util. Factor	1.00		0.91		1.00	0.91
Frt	0.90		0.99		1.00	1.00
Flt Protected	0.99		1.00		0.95	1.00
Satd. Flow (prot)	1658		5048		1770	5085
Flt Permitted	0.99		1.00		0.06	1.00
Satd. Flow (perm)	1658		5048		109	5085
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	72	187	2258	115	212	948
RTOR Reduction (vph)	75	0	3	0	0	0
Lane Group Flow (vph)	184	0	2370	0	212	948
Turn Type	Prot		NA		custom	NA
Protected Phases	8		6		7	1 2 7
Permitted Phases					1 2	
Actuated Green, G (s)	26.5		75.4		93.7	100.3
Effective Green, g (s)	26.5		75.4		86.8	93.7
Actuated g/C Ratio	0.19		0.54		0.62	0.67
Clearance Time (s)	7.7		6.4		5.5	
Vehicle Extension (s)	3.0		3.0		3.0	
Lane Grp Cap (vph)	313		2718		287	3403
v/s Ratio Prot	c0.11		c0.47		c0.10	0.19
v/s Ratio Perm					0.36	
v/c Ratio	0.59		0.87		0.74	0.28
Uniform Delay, d1	51.8		28.1		50.2	9.4
Progression Factor	1.16		0.85		0.81	0.91
Incremental Delay, d2	2.8		0.4		8.8	0.0
Delay (s)	62.9		24.2		49.5	8.6
Level of Service	E		C		D	A
Approach Delay (s)	62.9		24.2			16.1
Approach LOS	E		C			B

### Intersection Summary

HCM 2000 Control Delay	24.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.7
Intersection Capacity Utilization	83.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

# Queues

## 107: Meridian Ave & Whiting St

01/19/2022



Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	259	2373	212	948
v/c Ratio	0.67	0.87	0.72	0.26
Control Delay	46.2	25.3	49.4	7.5
Queue Delay	0.2	1.2	0.2	0.2
Total Delay	46.4	26.6	49.6	7.7
Queue Length 50th (ft)	154	471	120	73
Queue Length 95th (ft)	227	m306	#245	123
Internal Link Dist (ft)	878	712		229
Turn Bay Length (ft)				
Base Capacity (vph)	520	2723	294	3555
Starvation Cap Reductn	0	168	3	1503
Spillback Cap Reductn	32	52	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.53	0.93	0.73	0.46

### Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

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

# HCS7 Two-Way Stop-Control Report

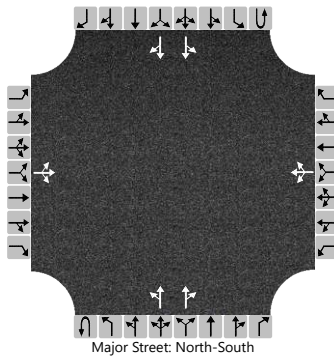
## General Information

Analyst	H.W. Lochner
Agency/Co.	
Date Performed	09/24/2021
Analysis Year	2046
Time Analyzed	PM Peak Hour
Intersection Orientation	North-South
Project Description	Whiting PD&E Study

## Site Information

Intersection	EWashingtonSt&JeffersonSt
Jurisdiction	FDOT, District 7
East/West Street	E Washington St
North/South Street	Jefferson St
Peak Hour Factor	0.95
Analysis Time Period (hrs)	1.00

## Lanes



## Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound				
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	
Movement																	
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6	
Number of Lanes		0	1	0		0	1	0		0	2	0		0	2	0	
Configuration			LTR				LTR			LT		TR		LT		TR	
Volume (veh/h)		22	125	79		180	51	150		170	708	88		247	483	38	
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2			
Proportion Time Blocked																	
Percent Grade (%)		0				0											
Right Turn Channelized																	
Median Type   Storage		Undivided															

## Critical and Follow-up Headways

Base Critical Headway (sec)		7.5	6.5	6.9		7.5	6.5	6.9		4.1				4.1		
Critical Headway (sec)		7.54	6.54	6.94		7.54	6.54	6.94		4.14				4.14		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.52	4.02	3.32		3.52	4.02	3.32		2.22				2.22		

## Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			238				401				179				260	
Capacity, c (veh/h)											1017				792	
v/c Ratio											0.18				0.33	
95% Queue Length, Q <sub>95</sub> (veh)											0.6				1.5	
Control Delay (s/veh)											9.3				11.8	
Level of Service (LOS)											A				B	
Approach Delay (s/veh)											2.4				4.7	
Approach LOS																

# HCS7 Two-Way Stop-Control Report

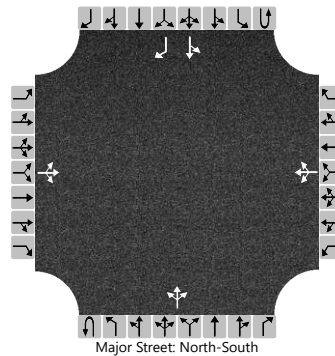
## General Information

Analyst	H.W. Lochner
Agency/Co.	
Date Performed	09/24/2021
Analysis Year	2046
Time Analyzed	PM Peak Hour
Intersection Orientation	North-South
Project Description	Whiting PD&E Study

## Site Information

Intersection	EWashingtonSt&BrushSt
Jurisdiction	FDOT, District 7
East/West Street	E Washington St
North/South Street	Brush St
Peak Hour Factor	0.95
Analysis Time Period (hrs)	1.00

## Lanes



## Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0		0	1	0		0	1	1
Configuration			LTR				LTR				LTR			LT		R
Volume (veh/h)		142	5	275		19	21	6		145	500	5		41	108	156
Percent Heavy Vehicles (%)		2	2	2		2	2	2		2				2		
Proportion Time Blocked																
Percent Grade (%)		0				0										
Right Turn Channelized											Yes					
Median Type   Storage		Undivided														

## Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.12	6.52	6.22		7.12	6.52	6.22		4.12				4.12		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.52	4.02	3.32		3.52	4.02	3.32		2.22				2.22		

## Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			444				48				153				43		
Capacity, c (veh/h)			348				133				1476				1036		
v/c Ratio			1.27				0.36				0.10				0.04		
95% Queue Length, Q <sub>95</sub> (veh)			59.1				1.6				0.3				0.1		
Control Delay (s/veh)			553.8				47.2				7.7				8.6		
Level of Service (LOS)			F				E				A				A		
Approach Delay (s/veh)		553.8				47.2				2.6				1.3			
Approach LOS		F				E											

# HCS7 Two-Way Stop-Control Report

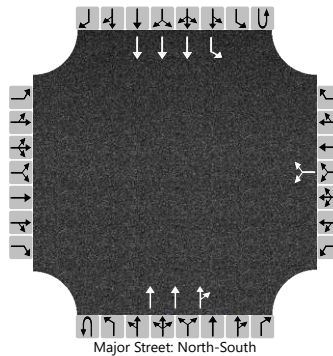
## General Information

Analyst	H.W. Lochner
Agency/Co.	
Date Performed	09/24/2021
Analysis Year	2046
Time Analyzed	PM Peak Hour
Intersection Orientation	North-South
Project Description	Whiting PD&E Study

## Site Information

Intersection	MeridianAve&EWashingtonSt
Jurisdiction	FDOT, District 7
East/West Street	Meridian Ave
North/South Street	E Washington St
Peak Hour Factor	0.95
Analysis Time Period (hrs)	1.00

## Lanes



## Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0		0	3	0		0	1	3
Configuration							LR				T	TR		L	T	
Volume (veh/h)						41		60			2411	391		0	5	1010
Percent Heavy Vehicles (%)						2		2						2	2	
Proportion Time Blocked																
Percent Grade (%)							0									
Right Turn Channelized																
Median Type   Storage							Left Only									1

## Critical and Follow-up Headways

Base Critical Headway (sec)						6.4		7.1							5.3	
Critical Headway (sec)						5.74		7.14							5.34	
Base Follow-Up Headway (sec)						3.8		3.9							3.1	
Follow-Up Headway (sec)						3.82		3.92							3.12	

## Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							106								5	
Capacity, c (veh/h)							33								40	
v/c Ratio							3.21								0.13	
95% Queue Length, Q <sub>95</sub> (veh)							40.5								0.4	
Control Delay (s/veh)							4238.7								107.8	
Level of Service (LOS)							F								F	
Approach Delay (s/veh)							4238.7								0.5	
Approach LOS							F									